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NOTICE.

A map was prepared to illustrate the routes of Dr. Beke and the Mission to Shwá; but within these four weeks additional journals and maps have been received from Dr Beke, which render material alterations necessary in the delineation of his route. It has been judged unadvisable to postpone the publication of the present part of the Journal till these alterations could be made. The map will therefore be given with the next part, which will appear as soon as the President's Address can be ready for publication. In the mean time the route of the Mission may be traced on the sketch map of the same ground which accompanied the paper of Messrs. Krapf and Isenberg.

It is proposed that in future the annual volume of the Journal shall be published in two semi-annual parts: the first containing the President's Address, to appear a few weeks after the annual meeting in May; the other at the re-commencement of the Society's meetings in November.

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1836.

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1837.

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1836.

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1837.

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1842.

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ANALYSES.

MISCELLANEOUS.

Royal Geographical Society.

1842.

REPORT OF THE COUNCIL.

The Council announce that, since the last Anniversary Meeting of the Society, 18 new Members have been elected, and 33 vacancies have occurred,—of which, 11 by death; 9 have resigned; and 13 have been struck off from the list in consequence of their having ceased for several years to pay their annual contributions.

The Society now consists of 658 Members, exclusive of 63 foreign Honorary and Corresponding Members. One foreign Corresponding Member, Colonel Count Karaczay, of Mantua, has been elected in place of General Campana, whose death the Council regret to announce; as also that of Admiral Dumont d'Urville, one of our foreign Honorary Members.

Finances.—The Society will observe, on inspecting the Treasurer's Annual Report, certified by the Auditors, that, in addition to the ordinary expenditure of the past year, amounting to the sum of 1656*l.* 4*s.* 9*d.*, there has been a further outlay of 692*l.* 15*s.* 9*d.*, to liquidate outstanding debts incurred in former years; and, in providing this sum, it was thought expedient to sell 1000*l.* Stock, part of the proceeds of which have been applied to these payments, and the rest is apparent in the balance in the banker's hands at the end of the year.

This additional call on the Society's funds has been occasioned partly by the difficulty of getting in some outstanding bills of former years, which had been repeatedly called for, and in part by the expense attending the removal into the new house in Waterloo Place, the fittings for books and maps, and by the unexpected demands made upon the Society to meet the expenses

of the Kurdistán expedition. The Council have now, however, the satisfaction to announce that there is no outstanding demand against the Society beyond the current expenses.

Money Grants.—The Council, having taken into consideration the services already performed and still likely to be rendered to geographical science by the zealous explorations of Dr. Beke in Africa, have voted him the sum of 100*l.*, to enable him to prosecute his useful labours.

Arrears.—The arrears due to the Society may be now estimated at 235*l.*, the greater part of which will, it is hoped, be recovered by degrees: 105*l.* of this sum are due from Members abroad.

Her Majesty's Donation.—Of the two gold medals to which Her Majesty's gracious donation is appropriated, that called the "Founder's Medal" has this year been awarded to Capt. J. C. Ross, R.N., for his brilliant achievement at the South Pole, to within less than 12° of which he has safely navigated his vessels the "Erebus" and "Terror," discovering at the same time a great Antarctic continent: and the "Patron's Medal" has been awarded to Dr. E. Robinson, of New York, for his very valuable work entitled "Biblical Researches in Palestine, Mount Sinai, and Arabia."

Publications.—In consequence of the great expenses incurred by the publication of three Parts of the Journal in each year—and which, being delivered *gratis* to the Members of the Society, have been in fact a full return of one-half of their annual subscription—the Council feel that it will be incumbent upon them hereafter to revert to the former practice of issuing two Parts only in the course of each year; for the regular appearance of which the Council have made the necessary arrangements; and, by a judicious condensation of the matter each Part will contain, they hope that the value of the Journal, and the mass of geographical information comprised in each yearly volume, will in no degree be diminished.

Library.—The accessions to the library since the last year consist of 360 volumes, and 542 maps and charts, among which are some very valuable donations—such as a selection, consisting of 392 sheets, from the great Catastral Survey of Bavaria, with several folios of astronomical, geodesical, and statistical data; presented to the Society by the munificence of His Majesty the King of Bavaria, and obligingly and judiciously selected by the Director of the Cataster, M. von Flg: The "Voyage autour du Monde, de l'Astrolabe," under the command of Captain Dumont D'Urville, 22 vols. 8vo., with 4 parts of Observations, and 500 beautiful plates: Colonel Codazzi's Map and Atlas of Venezuela, with 4 vols. of the History, Statistics, and Geography of that Country: and several beautiful and rare works on Geography and Travels, presented by Mr. Trevelyan, &c.

It is with feelings of peculiar gratification that the Council are able to close their Report by announcing the very handsome donation of 50*l.*, made by James Alexander, Esq., of Summer Hill, for the increase of the library.

BALANCE-SHEET FOR 1841.

Dr.

	£.	s.	d.
Balance in hand, 1st January, 1841	58	6	6
Entrance of 22 Members, at 3*l*.	66	0	0
Composition of 11 Members at 17*l*.	187	0	0
Subscription of 274 Members at 2*l*.	548	0	0
Arrears paid up	82	13	0
Dividends on 4150*l*., 72*l*. 12*s*. 6*d*. ,, on 3150*l*., 55*l*. 2*s*. 6*d*. } 3½ per Cent. Reduced	127	15	0
Royal Premium	52	10	0
Journals sold	139	8	5
Sale 350*l*. of Stock (Reduced 3½ per Cent.) at 97½	341	5	0
Sale 1000*l*. of Stock (Reduced 3½ per Cent.) at 98¾	987	10	0
	£2590	7	11

Cr.

	£.	s.	d.	£.	s.	d.
House Rent and Fixtures				204	11	3
Salaries				350	0	0
Printing Journal, Vol. X., 1500 Copies				446	14	6
Illustrations to Journal				98	16	0
Gold Medals				46	0	0
Stationery				6	6	0
Books and Maps				51	12	1
Collector				21	0	0
Messenger				18	6	0
Bookbinding				3	10	6
Carriage of Parcels and Postage				43	15	2
Expenses of Evening Meetings				11	7	4
Firing and Lights				11	9	6
Fittings				0	15	7
Insurance, Advertisements, and Power of Attorney				10	13	7
MS Map of Pernambuco				16	0	0
Kurdistan Expedition				313	2	9
Sundries as Christmas-boxes, &c.				2	4	6
Outstanding Bills previous to 1841.	£.	s.	d.			
Illustrations to Journal	116	4	6			
Miscellaneous Printing	5	9	6			
Engraving Diplomas	2	18	4			
Graah's Greenland	54	15	10			
Map of Khiva	7	0	0			
Books and Maps	126	8	2			
Bookbinding	53	6	6			
Cartoons	20	0	0			
Map-mounting	104	6	11			
Stationery	11	12	6			
Instruments	1	16	0			
Fittings	128	4	1			
Repairs	5	7	0			
Cleaning Apartments	3	10	0			
Horticultural Society	18	6	8			
Firing and Lights	19	16	1			
Tea	4	11	0			
Insurance, Advertisements, and Power of Attorney	9	2	8	692	15	9
Balance in the Banker's hands				209	6	11
,, of Petty Cash				32	0	6
				£2590	7	11

(Signed) JOHN BIDDULPH.

The above Accounts have been compared by us with the corresponding vouchers, and found to be correct —2nd February, 1842.

(Signed) { RAWSON W. RAWSON.
{ CHARLES DARWIN.

ESTIMATE FOR 1842.

Dr.	£.	s.	d.	*Cr.*	£.	s.	d.
Balance in hand (1st January, 1842)	241	7	5	Rent and Fixtures	263	13	0
Probable Amount of Subscriptions, viz.—				Salaries and wages	447	0	0
Entrance of 30 Members at 3*l.*	90	0	0	Office Expenses, including Firing, Lights, Meetings, Stationery, Postage, Carriage of Parcels, &c.	100	0	0
Composition of 15 ditto at 17*l.*	255	0	0	Insurance	2	15	0
Subscription of 300 ditto at 2*l.*	600	0	0	Furniture and Fittings	10	0	0
Arrears likely to be recovered	50	0	0	Journal	500	0	0
Dividends on 3150*l.* (3½ per Cents. Reduced)	110	5	0	Miscellaneous Printing	10	0	0
Royal Premium	52	0	0	Books, Bindings, &c.	80	0	0
Mr. Alexander's Donation	50	0	0	Royal Premium	46	0	0
Sale of Journal	150	0	0	Grant to Dr. Beke	100	0	0
				Sundries	10	0	0
	£1,598	12	5		£1,569	8	0

J. R. JACKSON,
Secretary.

At the Anniversary Meeting held on the 23rd May, 1842, the President presented the Gold Medals, awarded repectively to the Rev. Dr. Edward Robinson, Professor of Biblical Literature at New York, and Capt. James Ross, R.N., in the following words:—

"Mr. Everett,—It is with peculiar satisfaction that I perform on this occasion the most grateful of the duties imposed on the President of the Royal Geographical Society. I see before me the honoured representative of a nation bound to our own by all the dearest ties of kindred, of name, of language, of commercial pursuits, of a love of daring adventure, above all, by an attachment to a constitutional form of Government, and to real genuine liberty. And this representative is kind enough to present himself in this assembly to show his regard for science, in receiving for his countryman, the Rev. Dr. Edward Robinson, Professor of Biblical Literature at New York, the gold medal recently awarded to that gentleman by the Council of this Society, for the rich treasure of geographical knowledge contained in his work entitled 'Biblical Researches in Palestine, in Mount Sinai, and in Arabia Petræa.' Dr. Robinson tells us that for many years previous to this journey it had been the object of his ardent wishes, and had entered into all his plans of life; and it is plain that he brought to his task a mind richly stored with all the materials for travelling with profit. Leaving Trieste in the winter of 1837, Dr. Robinson proceeded hastily through the Ionian Islands to Greece, and thence to Egypt, where he was joined by Dr. Eli Smith, his former pupil, long a resident in the East, not only in Syria and Palestine, but also in Armenia, Persia, and Egypt, and already familiar with the inhabitants and their language, to the advantage of whose society and assistance Dr. Robinson is on all occasions happy to bear the fullest testimony, 'whose long and peculiar acquaintance with the language, and whose tact in conversing with and managing the Arabs, he never could too highly appreciate.' Dr. Robinson pictures to us most graphically the aspect of the Desert between Egypt and the western head of the Red Sea, the peculiarities of that spot, the various valleys and mountains between Suez and Mount Sinai, and the large plain now first noticed in front of Mount Horeb. He thence proceeds to the eastern head of the Red Sea, where Eziongeber and Eilah have given place to the puny fortress of Akabah: from which he follows the long and in great part new route across the great desert El Tih, on the elevated watershed between the Mediterranean and the valley or basin of El Ghor; and to him we first owe the identification of the sites of Eboda, Elusa, and Beersheba, on the road from Egypt to Hebron and Jerusalem. Of such identifications of ancient sites, now for the first time explored, there are at least 120 throughout the volumes.

"Dr. Robinson's description of Jerusalem and its valleys, its ancient remains, its reservoirs, ports, and aqueducts, in the city and throughout its environs, occupying a large portion of a N. and E. ridge, situated between the Mediterranean and the Dead Sea, is, beyond all comparison, the best we have; and it would be difficult to name any book on any

subject in which the author has more steadily kept in view the real importance and sterling value of truth: no preconceived notions, no fanciful theories seem to have led him astray from the path of personal and unbiassed investigation: a warm and sincere belief in the main objects of the history which he illustrates is in no instance warped, or prejudiced, or affected, in the one direction or the other, by monkish traditions or incredulous scoffings; and we rise from the perusal of the book with a conviction that the Christian world is at length in possession of a work, under the guidance of which (however some may differ from a few of its conclusions on points of minor topographical importance) they may make large and satisfactory advances towards an accurate knowledge of the geography of the Scriptures. This remark is especially applicable to Dr. Robinson's survey of the towns and villages in the immediate vicinity of the Holy City, few of which had been visited or identified by any preceding traveller.

"Dr. Robinson's first visit to the Dead Sea, at Ain Jedi, or Engaddí, almost due W. of Kurnul, is particularly interesting. This fountain appears to be the main source of sweet water on the western side. The first view of the sea above this point was from the summit of a perpendicular cliff 1500 feet above its waters. It has the appearance of a long estuary with many shoals and islands; but this optical illusion, which has deceived many travellers, is occasioned by so many spots of calm smooth water, around which the rest of the sea is covered with a ripple. The rock by which they descended to the water's edge is described as a compact reddish or rose-coloured limestone, smooth as glass, but with an irregular surface. Dr. Robinson estimates the Dead Sea as between 38 and 40 geographical miles long by 9 in breadth (Josephus had given to it 72 in length and 18 in breadth). From Ain Jedi Dr. Robinson coasted the western shores of the Dead Sea, by proceeding along the heights to the mouth of the Jordan; and describes very minutely the double and triple ranges of banks which enclose the waters of this celebrated stream. On a subsequent journey he explores the southern shore of that sea, a large portion of the El Ghor, the Wadis. El Jeib and Arabah, the former of which he describes as a deep torrent valley worn by water along the wide plain of the latter; and he fixes on grounds only short of positive certainty the important site of Kadesh Barnea at Ain El Weibeh, over against Edom and Mount Hor.

"As far as Dr. Robinson's travels extended in this region (and they comprehended Wadi Musa, or Petra, on the western flanks of Edom, from which spot he was unfortunately prevented by the violence of the native Arabs from penetrating farther south), the result of his observations is most satisfactory, in proving the non-existence of a supposed continuous valley descending from the Dead to the Red Sea; and that the former sea is the centre of a long basin called El Ghor, reaching in its fullest sense from its commencement at the sources of the Jordan in Mount Hermon, to its termination at a ridge of elevated land somewhere south of the Southern Wadi Ghurundel, about three-quarters or four-fifths of the way from the Dead to the Red Sea, and which acts as a watershed between the two seas.

"It is also clear, from the authorities quoted by Dr. Robinson, that

in ancient times no allusion is made to this supposed Valley of Arabah in a regular slope from one sea to the other; and that the term which frequently occurs in the Scriptures is applied to the plains and deserts in the regions more or less adjoining to the Asphaltite Lake.

"North of Jerusalem, Dr. Robinson visited and described with the same care Shiloh and Mount Gerizim, with the valley and environs of Naplous or Neapolis, the Sychar of the Samarians, the city, valley, and fountain of Jezreel, the plain of Esdraelon, Nazareth, Mount Tabor, Tiberias and its lake, Bethsaida, the ancient Julias, on the eastern slopes of the upper valley of the Jordan, Safed, Tyre, Sidon, and Beiruth.

"Indebted as we are for the number of places which Dr. Robinson by his zeal and industry has identified with ancient sites, we owe him almost an equal measure of thanks for those which he has stripped of designations erroneously attributed to them: the detection of an error is as useful as the establishment of a truth; and in this respect his remarks on Ramleh and Eleutheropolis, for fulness of detail and precision of argument, are models of topographical criticism.

"One of the greatest proofs of the value of Dr. Robinson's researches must not be overlooked. In visiting Berlin on his way home, the information he had collected attracted the attention, and engaged the assistance, of a learned individual, whose name can never be mentioned here without respect, Dr. Carl Ritter, of whose advice and unwearied kindness Dr. Robinson speaks in the highest terms; and he adds that the many months of cherished intercourse to which Ritter's friendship admitted him will ever remain amongst the brightest recollections of his life. In all great undertakings much of the success, even of the most successful, depends on the co-operation of others; and the measure of a man's success and merit may often be appreciated by the readiness with which such co-operation has been tendered, and by the liberality with which it is acknowledged. With this feeling, Dr. Robinson will thank us for adding to the names of his friends Smith and Ritter, that also of Mr. H. Kiepert, of Berlin, a young scholar, he says, of great talents and promise, who, under his inspection, constructed the very beautiful and detailed maps which accompany his work, and who has attached in the appendix to the third volume a very learned memoir, treating of the elements on which is based each of the maps, viz. of Mount Sinai, Arabia Petræa, Jerusalem and its environs, Palestine south and north of Jerusalem, the environs of the Lake of Tiberias, those of Beiruth and Mount Lebanon respectively. This memoir is a model for all similar works.

"Mr. Everett,—I ought, perhaps, to apologise for so long detaining you on this subject, but we are too happy to see you amongst us not to be tempted to dwell on the occasion which has brought you; and I have only farther to request that you will be kind enough to convey to your learned countryman our best wishes for his health and prosperity, and that he may live to fulfil the great object which he says he has still in view, namely, the adaptation of all the materials collected by himself and by Dr. Eli Smith into one systematic work on the physical and historical geography of the Holy Land.

"In placing in your hand the patron's medal, awarded by the Council

of the Royal Geographical Society to the Rev. Dr. Robinson, of New York, for his valuable services in the promotion of geographical research, I beg leave to add the expression of our warmest thanks to yourself individually for the honour you have conferred upon the Society by your presence on this occasion."

To which Mr. Everett replied,—

"Mr. President and Gentlemen,—I perform a very agreeable duty in appearing as the representative of my learned and ingenious countryman, Dr. Robinson, to receive this beautiful medal which the Royal Geographical Society has been pleased to award him for his late valuable work. I beg leave, on his behalf, to make to you, Sir, and to the Council of the Society, those grateful acknowledgments which are due for this distinguished honour, and for the emphatic and discriminating commendation which you have bestowed on the 'Biblical Researches.' The favourable opinion of the Royal Geographical Society, expressed in this public and authentic manner, will give the character of a standard work to a production which had already been received with no ordinary degree of public favour. I am sure that my learned countryman will feel himself encouraged and stimulated by the Society's flattering notice to the still more zealous pursuit of the studies and researches of which he has already reaped so brilliant a reward.

"Permit me to say, Sir, as the official representative of the United States of America in this country, that the circumstance which has procured me the honour of your kind invitation this day is of the most gratifying character. It affords me high satisfaction that a countryman of mine should have produced a work deemed worthy of these testimonials of approbation, in reference to a land which more than any other on the surface of the globe concentrates the affections of the Christian, that is, the civilised portion of mankind: a land which, to the interest of a long series of the most extraordinary incidents and revolutions going back to the dawn of human history, unites that higher and more sacred interest which belongs to it as the theatre of events, compared with which the vicissitudes of human things sink into insignificance.

"Allow me, Sir, in conclusion, to observe that this act of the Royal Geographical Society will be viewed with pleasure by my countrymen at large. They will consider it as a proof that our two countries, though politically distinct, are regarded by this most respectable association as members of one community of letters; and that you are disposed to cherish and strengthen those good feelings which ought to prevail—and, I trust, ever will prevail—between two nations of common language and kindred blood. This disposition, let me say, Sir, is cordially reciprocated by the men of science and literature in America; and on their behalf, as well as that of the individual immediately concerned, I again repeat my thanks for the honour done him by the Society, and the eminently kind and courteous manner in which you have been pleased, Mr. President, to carry their purpose into effect. I shall lose no time in conveying their medal to Dr. Robinson; and I am sure that I have but imperfectly anticipated the grateful sentiments with which its reception will be acknowledged by him."

The President then, addressing Mr. Ross, said:—

"Mr. Ross,—The first occasion, on which I had the satisfaction from this chair to present the royal premium awarded by the Council of the Royal Geographical Society, was on the return of Captain James C. Ross's gallant uncle, Sir John Ross, from his ever-memorable North Polar Expedition; during which, by his own energies aided by the vigorous and able individuals under him, and unsupported by the protection of a pennant, he had been able to execute most of the purposes for which he was sent out; and during four polar winters to maintain in health and discipline a body of British sailors exposed to the severest privations, and under difficulties till then unexampled. In the course of that expedition Captain James Ross, of whom you, his honoured father, are, by a happy and affectionate inversion of the order of nature, now his representative, had the good fortune to ascertain as correctly as could be expected the true magnetic pole of the northern hemisphere, and to plant the British standard on the frozen ground which covered it.

"Captain Ross had, previously to his joining this expedition to Boothia Felix, borne his part in the First Polar Expedition, under his uncle, Sir John Ross, to Baffin's Bay; he had also accompanied Sir E. Parry on his Three Polar Expeditions; namely, those which terminated at Melville Island, at the Hecla and Fury Straits, and in the attempt to reach with boats the North Pole.

"In 1840 the same officer, with whose name, as also with those of Franklin, Parry, and Back, Polar Discoveries had now become almost identified, was selected to the command of an Expedition consisting of Her Majesty's ships Erebus and Terror (the latter under the command of Captain Crozier), for the purpose of exploring the regions, whether of land or sea, around the Antarctic Pole, and at the same time to conduct a series of magnetic observations, so as to determine the isodynamic oval, and the point exactly between the two foci of greater magnetic intensity.

"Captain Ross entered the Antarctic Circle on the 1st of January, 1841. After a few days' delay he succeeded in passing through the pack ice, from lat. 66° 45′ S. and long. 174° 16′ E., to lat. 70° 41′ S. and long. 172° 36′. On the 12th of January he landed on a small island, wholly composed of igneous rocks, in lat. 71° 56′ S. and long. 171° 7′ E., at the foot of a range of lofty mountain-peaks from 9000 to 12,000 feet in height, covered with eternal snow; the glaciers, that descended from near the mountain summits, projecting many miles into the ocean, and presenting a perpendicular face of lofty cliffs.

"On the 23rd of January the Expedition reached the latitude of 74° 15′ S., the highest southern latitude ever till then attained. Still farther to the south they again landed on an island, as before wholly composed of igneous rocks, in lat. 76° 8′ and long. 168° 12′. And on the 28th a mountain, 12,400 feet above the level of the sea, was seen emitting flame and smoke in splendid profusion. It is in lat. 77° 32′ and long. 167° E. This was called Mount Erebus, and an extinct volcano to the east, less elevated, received the name of Mount Terror. The greatest geographical discovery of modern times was thus made within one short month, amid regions of perpetual ice.

"The long range of high lands seen to be stretching from lat. 70° 41', long. 172° 36', to lat. 78° and long. 191° 23', was called Victoria Land. The highest latitude reached by the Expedition was 78° 4'.

"We have thus the satisfaction to know that our intrepid countryman has approached the South Pole more nearly, by some hundreds of miles, than any of his predecessors in these difficult and dangerous enterprises. And from the multitude of magnetic observations made in both the ships, and in so many different directions from the pole, they have been able to determine its position with nearly as much accuracy as if they had reached the spot itself. It is with unmixed satisfaction also that I have further to state that this arduous service has been accomplished without the occurrence of any casualty, calamity, or disease of any kind; and when Captain Ross wrote from Van Diemen's Land, on the 7th of April, 1841, there was not a single individual in either of the ships on the sick list.

"The discovery of a new Continent in these inhospitable seas cannot, I presume, be productive of much advantage in extending our commerce, or in enlarging the sphere of civilization; but it has enlarged the boundaries of science, it has already contributed to a more accurate delineation of the surface of our globe; it offers new data for the geographer and the geologist to investigate the causes, which are constantly in action, for elevating the depths of the sea and for depressing mountain-ranges; and it has secured to the name of Ross a distinguished place amongst the most successful votaries of science, and the brightest ornaments of the British Navy."

Mr. Ross, on behalf of Captain J. C. Ross, expressed in warm and appropriate terms his grateful acknowledgment of the honour conferred upon his son; and, on his own account, the gratification which he felt at having been selected to receive for his son so flattering a testimony to his deserts.

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Y.

Yarborough, the Earl of
Yates, Rev. James, M.A., F.L.S. and G.S.
Yates, John Ashton, Esq.
Yates, Joseph Brookes, Esq.
Young, George F., Esq., M.P.
Young, James, Esq.
Young, Charles Baring, Esq.
Yorke, Lieutenant-Colonel, P.S.

NAMES OF INDIVIDUALS TO WHOM THE ROYAL PREMIUM HAS BEEN AWARDED.

1831.—Mr. RICHARD LANDER, for the discovery of the course of the River Niger or Quorra, and its outlet in the Gulf of Benin, in Central Africa.

1832.—Mr. JOHN BISCOE, for the discovery of the land now named "Enderby's Land" and "Graham's Land," in the Antarctic Ocean.

1833.—Captain Sir JOHN ROSS, R.N., for discovery in the Arctic Regions of America.

1834.—Major Sir A. BURNES, C.B., F.R.S., for the navigation of the River Indus, and a journey by Balkh and Bokhara across Central Asia.

1835.—Captain Sir GEORGE BACK, R.N., for the discovery of the Great Fish River, and navigating it to the sea on the Arctic Coast of America.

1836.—Captain ROBERT FITZROY, R.N., for the survey of the shores of Patagonia, Chile, and Peru, in South America.

1837.—Colonel CHESNEY, R.A., F.R.S., for the general conduct of the "Euphrates Expedition" in 1835-6, and for the accessions to comparative and physical geography relating to the countries of Northern Syria, Mesopotamia, and the Delta of Susiana.

1838.—Mr. THOMAS SIMPSON, [Founder's Medal,] for the discovery and tracing, in 1837 and 1838, of about 300 miles of the Arctic shores of America.

——— Dr. EDWARD RÜPPELL, [Patron's Medal,] for his travels and researches in Nubia, Kordofán, Arabia, and Abyssinia.

1839.—Mr. R. H. SCHOMBURGK, [Patron's Medal,] for his travels and researches during the years 1835-9 in the colony of British Guayana, and in the adjacent parts of South America.

——— Major H. C. RAWLINSON, E.I.C., [Founder's Medal,] for his travels and researches in Susiana and Persian Kurdistán, and for the light thrown by him on the comparative geography of Western Asia.

1840.—Lieut. RAPER, R.N., [Founder's Medal,] for the publication of his work on "Navigation and Nautical Astronomy."

——— Lieut. JOHN WOOD, I.N., [Patron's Medal,] for his survey of the Indus, and re-discovery of the source of the River Oxus.

1841.—Captain JAMES CLARK ROSS, R.N., [Founder's Medal,] for his discoveries in the Antarctic Ocean.

——— Rev. Dr. E. ROBINSON, of New York, [Patron's Medal, for his work entitled "Biblical Researches in Palestine."

LIST OF PUBLIC INSTITUTIONS, &c., ENTITLED TO A COPY OF THE LONDON GEOGRAPHICAL JOURNAL.

Antiquaries, Society of
Architects, Institute of British
Arts, Society of
Asiatic Society (Royal)
Astronomical Society (Royal)
Athenæum Club
Engineers, Institute of Civil
East India Company's Library
Edinburgh, Royal Society of
Geological Society
Horticultural Society
Hudson's Bay Company's Library
Hydrographic Office, Admiralty
Linnæan Society
Literature, Royal Society of
Royal Institution
Royal Society
Statistical Society
Travellers' Club
United Service Institution
Zoological Society

Athens . . . University Library
Berlin . . . Academy of Sciences
Copenhagen . Royal Society of Sciences
Royal Society of Northern Antiquaries
Dresden . . . Statistical Society
Florence . . Library of the Grand Duke of Tuscany
Frankfort . . Geographical Society
Geneva . . . Société d'Histoire Naturelle
Lisbon . . . Royal Academy of Sciences
Munich . . . Royal Library
Naples . . . Minister of the Interior
Paris . . . . Academy of Sciences
— . . . . Asiatic Society
— . . . . Bibliothèque du Roi
— . . . . Dépôt de la Guerre
— . . . . Dépôt de la Marine
— . . . . Société de Géographie
— . . . . Société Ethnologiqué
St. Petersburg Imperial Academy of Sciences
Stockholm . . Royal Academy of Sciences

INDIA.

Bangalore . . Public Library
Bombay . . . Geographical Society
Calcutta . . Asiatic Society of Bengal
Delhi . . . . Public Library
Dumdum . . . Public Library
Haiderabád . Public Library
Khánpor . . . Public Library
Madras . . . Literary and Philosophical Society
Meerút . . . Public Library
M'how . . . . Public Library

Cairo . . . . Egyptian Society

Philadelphia . American Philosophical Society
— Franklin Institute
Boston . . . Bowditch Library

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY OF LONDON;

Delivered at the Anniversary Meeting on the 23rd May, 1842,

WILLIAM RICHARD HAMILTON, Esq., F.R.S., &c.
PRESIDENT

GENTLEMEN,

DURING the two years which have elapsed since I had the honour of addressing you from this chair, the Science of Physical Geography has made large and rapid strides, but is still very far from the goal to which we all look. Immense tracts of land in every quarter of the globe, some even surrounded by populous and comparatively well-known districts, still only deserve to be described as *terræ incognitæ* to the geographer, the historian, and the traveller. But still the science which we profess to cultivate, and which, we are proud to say, we have cultivated not without success for the last ten or twelve years, has advanced, is advancing, and promises to advance in an increasing ratio. The commercial adventurer, prompted by views of interest; the traveller, in pursuit of knowledge; the politician, seeking to combine his projects of ambition with the welfare, well or ill understood, of his own country; the pioneer by land or by water who precedes, and the warrior who follows, for conquest or for loss, for fame or for defeat, all equally conspire to aid our views; all imperceptibly add to our stores; and whilst, as in other worldly matters, each individual, each mass of individuals, each body corporate is struggling for its own narrow purposes, by the happy dispensation of Providence, the whole is brought sooner or later into one focus, which, however large and comprehensive in its details, will in its turn form but one unit in the further progress the human kind is perhaps destined to make towards universal science.

I have said that large portions of the surface of our globe are still *terræ incognitæ* to us. We must not be surprised at this. I speak of regions far distant from European civilization; but if we look nearer home, close even to our own doors, we shall find that we are still very far from our boasted accuracy; that maps which half a century ago were thought, or at least were designated, as nearly perfect, are now proved to be utterly fallacious, and in many instances require to be recomposed.

What, then, can we expect beyond approximate certainty for the uncivilized portions of the earth? The seeds, however, are sown; the soil is kindly; whatever the winds that blow, and from whatever quarter the storm threatens, we are sure of an abundant harvest, if we do not sleep over our work; we lack no reapers to bring home the produce; be it ours to house it well, and to do our best in order to spread it amongst those who come to receive what we can distribute; and above all, to take care that we separate the wheat from the chaff, and that we give only sound and wholesome nourishment to our guests.

I have said that war, trade, and the spirit of discovery are our principal allies in these pursuits. But as they will generally act together, and support each the other, so will they at times thwart and counteract one another. Sometimes, as formerly in America, so now in China and the East, they go hand in hand, and throw back the limits of geographical knowledge. At other times too great ardour in the pursuit of it, and a want of prudence in displaying too openly its results, will, by exciting jealousies, and leading to acts of violence and outrage, annihilate in one moment the labours of months.

But I must not take up your time in abstract generalizations: we deal in matters of fact, and to them we must return; and, in compliance with former practice, our first attentions are due to the honoured dead.

Obituary.

The early and violent death of one of our most distinguished members, Sir Alexander Burnes, who fell a victim by assassination in the outbreak at Caboul early in November last, has occupied so many fears, and has been a subject of such universal regret, that I should not be justified in dwelling upon this event longer than it may be necessary to add the expressions of sorrow felt for the loss by The Royal Geographical Society; a body which was amongst the first to stamp upon Burnes's career in the pursuit of science the most solid mark of approbation in their power to bestow. It is now eight years since this valued and lamented officer received the royal premium in these rooms from the hands of the present Master-General of the Ordnance,

then your president. This proof of your admiration for his talents, and of your confidence in what those talents were further capable of bringing about, was bestowed for the ardour, zeal, ability, and judgment evinced by Sir Alexander Burnes in conducting the first European expedition which had ever encountered the stream of the Indus from its mouth to its source, and also for the exemplification of the same high qualities during his journey from the banks of the Indus through Caboul, across the Hindu Koosh, by Balk and the Transoxiana, to Bokhara, and into Persia.

During a life of unremitted activity, and most valuable services to the East India Company, Sir Alexander Burnes was a second time employed to ascend the Indus: on this occasion the river was more accurately surveyed by Lieutenant Wood, and a work which may be said to be a posthumous publication has recently appeared, which has added very materially to our knowledge of the countries adjacent to that river, and which will add to the fame of an officer, whom all his countrymen in the east and the west had hoped would long have been spared to us for the completion of still more important labours.

Captain Bird Allen, R.N., was one of the victims of the late unfortunate expedition up the Niger, when he had the command of the Soudan. He was also a member of our Society, and the last volume of our Journal contains a sketch of the eastern coast of Central America, compiled by this officer from the notes of Captain N. Owen, and the officers of the "Thunder" and "Lark." The survey was prosecuted from Cape Catoche, the N. E. point of Yucatan, 21° 31′ N. lat., in a southerly direction for 37 miles along the eastern shore of that peninsula, including the shores of Spanish Yucatan, and the British settlement of Honduras; then in an easterly direction 350 miles to Cape Gracias à Dios, comprising part of the coast of Guatemala and Mosquitia; and lastly, again to the south for 250 miles to the Colorado river, in lat. 10° 47′ N., long. 83° 37′ W., being the remainder of the coast of Mosquitia, and forty-five miles of the coast of Nicaragua.

The most remarkable geographical feature of this coast, Captain Bird Allen observes, is the chain of coral reefs and small islets at an average distance of 15 miles from the mainland of Belise, with a clear navigating passage within them, from four to eight miles wide; within this natural breakwater ships and boats navigate in all weathers by night and day. Its sea boundary is a perpendicular coral wall of very great depth.

We have also to deplore the death of another member of the Society, Captain William Cornwallis Symonds, eldest son of Sir William Symonds, Surveyor of the Navy, and himself Deputy Surveyor-General

of New Zealand. This meritorious young officer was unfortunately drowned in November last, by the upsetting of a boat, in which he was crossing the Bay of Avito, on a duty of friendly benevolence. An account of his first explorations in New Zealand has been read at one of our evening meetings, and we were expecting a detailed memoir of his labours, together with maps. Captain Symonds was zealous and indefatigable in the pursuit of his duties; and in his death, which is a very great and immediate loss to the interest of a rising colony, the Society are bereft of an ardent and able co-operator in the cause of geographical science.

Amongst the members whose loss the Society has suffered during the last year, is Commander Michael Atwell Slater, R.N., an officer who had earned for himself a distinguished reputation in the scientific branch of his profession. His peculiar taste for hydrographical pursuits led him from the ordinary duties of the service in times of peace; and in 1816, five years after he entered the navy, we find him assisting in the extensive and well-known surveys of Captain W. H. Smyth, in the Mediterranean. After the conclusion of that vast work, an ample field was offered to his exertions on the shores of his own country, in conducting the survey of the eastern coast of England and Scotland. To this service he was appointed by the Lords Commissioners of the Admiralty previous to 1830, and he surveyed the coasts of Durham, Northumberland, and Scotland, from Hartlepool to Fort William, with a degree of accuracy which could not be surpassed. His drawings are remarkable for their faithful detail and the neatness of their execution; and so entirely was his whole mind devoted to the important duty with which he was intrusted, that not only did he spare no personal exertion that could forward it, but expended much of his own private resources on this laudable object. It was in the midst of such useful labours that Commander Slater was cut off in the prime of life, on the 2nd of February last, by falling into the sea over the cliff called Holburn Head, on the eastern extremity of Scotland.

Geography has likewise experienced a very severe loss in the untimely death of Dr. Lord, the companion of Burnes and of Wood, who had done most valuable service in the course of their navigation up the Indus, and who was killed at Parwan, in the last action of our troops with Dost Mahommed, on the 2nd of November, 1840. Sir Alexander Burnes, in his 'Caboul,' gives two of Dr. Lord's letters from Khoondooz, dated December, 1837, which, as he says, cannot be read without deep interest, and with a melancholy regret at the death of their energetic and accomplished writer.

I shall hereafter have occasion to mention the circumstances under

which the cause of geography has lost one of its most ardent followers in the person of Dr. Forbes, who had just completed a tour of observation amongst the countries watered by the Helmund, in the west of Afghanistan.

The late distinguished officer of the French marine, and one of her most celebrated circumnavigators, Admiral Dumont d'Urville, was one of the unfortunate victims of the railway accident which took place on the 8th inst. at Meudon. He was President of the Geographical Society of France. Captain d'Urville left France on his first voyage to the South Seas in 1826, and returned in 1829, having visited New Zealand, New Holland, New Guinea, the Carolinas, &c. His second voyage was commenced in September, 1837, and he again returned to France in 1840, having reached 66° 30′ of south lat., in long. 138° 21′. During this voyage he discovered La Terre Adèle and Clarie, and he received the honorary distinction of the medal of the Geographical Society of Paris in 1841.

I regret to have to announce to you the death of General Campana, who, by birth a Neapolitan, was the Director of the Austrian Military Geographical Institute at Vienna, where he died on the 8th of June last year. General Campana was one of our foreign honorary members: it was by this distinguished geographer that the proposition was made to the Emperor of Austria to construct a chorographical map of all Italy on the scale of 3 lines to 1000 toises, in consequence of which, Austrian engineers have commenced their operations in the Papal states.

The Bombay Geographical Society, one of our earliest affiliations, have had to deplore the loss of Dr. Heddle, their late Secretary, who filled also the same office in the Horticultural Society of that presidency: this gentleman had made himself eminently useful in the organization and general proceedings of both these establishments; and their members have come eagerly forward on the occasion to testify their conviction of the superior acquirements, enlightened views, and unwearied exertions, which Dr. Heddle had always evinced in guiding and co-operating with their endeavours to extend the boundaries of geographical knowledge, and to call forth the agricultural and commercial resources of India. As geographers we are bound more particularly to lament the loss of Dr. Heddle, who was always ready to give instructions to any one who expressed a wish to contribute papers on geographical subjects for the meetings of the Society.

Russia has lost during this year Mr. Boethling, a young man of very promising talents, who had made a geognostic tour into Russian Lapland; Mr. Sokolowsky, author of an elementary treatise on Geography for the Military Schools (3 vols. 8vo. 1839-41); and Mr. Bienimann, author of

a Geographical Notice on the Governments of Esthonia, Livonia, and Courland.

Progress of Geography.

England.—The *maritime surveys* of the coasts and islands of Great Britain, and of her foreign possessions, are still carried on with the same zeal and talent which have ever characterized this department, as well as every other, of our naval service.

The following are those which especially invite our notice :—

1. Captain Bullock, of H. M. S. Fearless, having completed the survey of the river Thames from London Bridge to the Nore, on such a scale that all future changes in the banks will be detected, is now employed in the mouth of the river, and is uniting his own work with the Survey of the North Sea.

2. Captain Washington, of H. M. S. Shearwater, whose energies and devotion to the cause of geography almost all who hear me have for several years witnessed and admired within these walls, has been for the last year employed in carrying on the survey of the North Sea between the lat. of 52° 10′ and the Dutch and Belgic coasts, a large portion of which had been completed by the late Captain Hewitt, and published by the Board of Admiralty. In order to accelerate the completion of this great undertaking Captain Washington has the command of a steam-vessel and an accompanying tender, both well adapted to the service.

3. On the north coast of Scotland the more easterly parts of the survey had been nearly finished, and the party had reached Thurso, when, on the death of Commander Slater, the highly skilful and zealous conductor of the survey, Lieutenant Otter, who had been some time under his orders, was appointed to continue the service.

4. The survey of the west of Scotland has already advanced northward from the Solway Firth to the Firth of Clyde; and it will probably be completed in the ensuing season.

5. Mr. George Thomas, of H. M. S. Mastiff, is still engaged on the survey of the Shetland and Orkney Islands: the shortness of the season and the severity of the weather in that climate make a very rapid advance quite impracticable.

6. Commander Sherringham, of H. M. S. Sylvia, having last year finished a very minute chart, on a large scale, of Spithead, is now extending his work to St. Helen's and the Owers.

7. The Irish Channel has long been very imperfectly explored. A survey of this sea, under the direction of Captain Beechey, of H. M. S. Lucifer, and which has already made considerable progress, will greatly

increase the confidence of those by whom it is navigated, and will ultimately, by the judicious use of its soundings, enable the mariner to traverse it with nearly equal security at night, or in a fog, as by daylight.

8. The east coast of Ireland from Donegal Bay to Dublin Bay, surveyed by the late Commander Mudge, has been published, and Commander Frazer is now proceeding southward towards Wexford, after examining that dangerous series of rocks, which almost denied access to this most vital part of Her Majesty's dominions.

9. The survey of the Shannon, having been completed from Limerick to Fergus Bay, is now, under the direction of Lieutenant Wolfe, rapidly advancing towards the entrance of that river.

10. Commanders Graves and Brock, of H. M. ships Beacon and Magpie, have thoroughly examined the western shores of Asia Minor. Deep and wide gulfs, little visited since the days of Athenian supremacy or Roman conquest in those seas, have been charted; and numerous cities on those classic shores have been rescued from oblivion by their labours. Captain Graves is now about to undertake the survey of the coasts of Crete and Cyprus: when these are completed he will proceed to the shores of Syria and Palestine, and if an opportunity offers he has been instructed to carry a set of chronometers to the temple of Jerusalem.

11. The river St. Lawrence from Montreal to the island of Anticosti, and the northern shore of the gulf of that name, through the strait of Belleisle, have been surveyed by Captain Bayfield in the hired vessel Gulnare. This indefatigable officer has since been employed upon the southern shore of the gulf, along the coast of New Brunswick; and he is now surveying that of Prince Edward's Island.

12. Commander Barnett and Mr. Lawrence, of H. M. ships Thunder and Luck, have been for some years engaged, alternately according to the season, along the coast of Mexico and among the Bahama islands. The details of these last were till recently quite unknown, and their longitude, in some places, erroneous by a whole degree. The minute examination of the many dangerous shoals, and bays, and coral banks, which are found in these seas, has been followed by real benefit: Commander Barnett will now press forward into the Gulf of Mexico; he has already laid down some dangerous reefs off the coast of Campeché.

13. Captain Belcher and Commander Hellett, of H. M. ships Sulphur and Starling, having laboured for four or five years on the west coast of America, were returning home by China; but, being detained on the Chinese coast in consequence of the war, their enterprising activity as seamen, and their skill as pilots, have been of the utmost service during

the operations of Her Majesty's land and sea forces engaged in that part of the globe. The Sulphur, being nearly worn out in the service, is now on her way home ; but the Starling is so useful an addition to the fleet on an imperfectly known coast, that the Admiral has determined to retain her under his command.

14. Much of the hitherto unknown north-west coast of Australia has been recently explored by Captain Wickham, of H. M. S. Beagle, and, since that able officer was obliged to invalid and come home, Lieutenant Stoke, who was appointed as acting Commander in his absence, has discovered some navigable rivers emptying themselves into the Gulf of Carpentaria: we hope soon to receive further details of this very interesting fact. The survey in those seas will be continued by Captain Blackwood and Mr. Yule, of H. M. ships Fly and Bramble, which have lately left our shores : their main objects will be the examination of the great barrier reef, which extends from 25° south lat. to Torres Strait, the survey of the passage through that strait, and the extension of their researches along the south coast of New Guinea and the Louisiade.

15. The Falkland Islands were partially examined by Captain FitzRoy in 1834 ; and since in more detail by Lieutenant Robinson of the Arrow: but this officer having been obliged from ill health to relinquish the survey, the continuation of it has been made over to Commander Sulivan, of H. M. S. Philomel.

16. Captain Vidal, having returned from the examination of the ground near the Azores, where it was suspected that shoals might have been formed by the recent earthquake, is now about to proceed to the survey of the central group of those islands.

Besides these important maritime surveys, which during the last twelve months have occupied much of the attention of the Hydrographic Office of the Admiralty, this active institution has engraved and published 105 charts of various parts of the globe, exclusive of four of our own seas and inland waters.

Copies of all these works are deposited, by the liberality of the Lords Commissioners of the Admiralty, in the collection of maps and charts belonging to this Society, where they are at all times open to the inspection of the members, and of all others who may wish to consult them.

Ordnance Surveys.—The latest account we have of the progress of the great ordnance map of England is up to the 31st of March : at that time all to the south of a line drawn east and west through Leeds had been published, with the exception of three sheets then in the hands of the engravers. The surveying is going on in Lancashire and Yorkshire, a part of which counties, together with Westmoreland, Cum-

berland, Durham, and Northumberland, were all that remained to complete the survey of England. The six northern counties of England, together with Scotland, will be on a scale of 6 inches to the mile. Towns having a population exceeding 4000 souls are laid down on a scale of 5 feet for a mile.

Of the Irish survey all the counties have been published except seven, four of which are in the hands of the engraver. Of 115 Irish cities and towns, 74 have been surveyed on a scale of 5 feet to a mile, 22 upon smaller scales, and 19 plans of towns have not yet been received. Of the large town maps of Ireland one sheet only has yet been published—viz., the Castle Sheet, Dublin.

The Ordnance geological maps of Cornwall, Devon, and West Somerset, are completed; and an 8vo. volume, containing a report of the geological structure of the same district, with a detailed account of its economic geology, was published by order of the Lords Commissioners of Her Majesty's Treasury. Another 8vo. volume, describing its organic remains, has also appeared under the same authority. The Ordnance geological survey of Great Britain is now engaged on the district comprising South Wales, Monmouthshire, Herefordshire, Gloucestershire, and East Somerset. The maps of these districts are in a forward state, and when published will be accompanied by special reports. The importance of the undertaking, both in a scientific and economic point of view, is too self-evident for me to dwell upon it; and, confided as it is to so experienced a geologist as Sir H. T. de la Beche, we are justified in reposing a most perfect confidence on the veracity of its details.

Russia.—In 1828 the Russian government directed that a survey of the coasts of the Baltic within its territories, worthy of the advanced state of the science of geodesy, should be undertaken. Similar operations had previous to that time been carried into effect on their respective coasts by the governments of Sweden, Prussia, and Denmark. It was resolved to begin by measuring a chain of triangles along the Russian coast, and over the islands in the Gulf of Finland, for the purpose of determining a number of points, and then to fill up the outline by soundings and other nautical operations. The observations were to be adjusted to the accurate trigonometrical operations of Generals Schubert and Tenner, and to the meridian measurement of Struve, wherever these reached the coast.

The trigonometrical and astronomical operations were begun in 1829, and completed in 1838. One basis was measured at Revel and another at Aland in Finland. Upwards of 600 points were trigonometrically determined, and for greater accuracy the elevation of the pole and azimuths were taken by observation at ten points. Theodolites by

Ertel were used in measuring angles, and a twelve-inch universal instrument, by the same master, was employed in the astronomical observations. The triangulation is connected at one extremity across the Aland Haaf with the trigonometrical measurement of Professor Cronstrandt in Sweden, and is linked to the operations of Bessel in Prussia through the medium of General Tenner's measurement in Courland. The chronometrical expedition of Lieutenant-General Schubert in the Baltic in 1833 (Journal of the Royal Geographical Society, Vol. VI. p. 413) was instituted with a view to contribute greater accuracy to these operations.

These preliminary labours having been completed, the detailed survey of the coast of Finland was commenced in 1833. Row-boats were employed to take the soundings within the reefs and 10 versts seawards; and to ensure accuracy the surface of the sea was divided into squares having a verst to each side by means of flag-buoys, the exact positions of which were ascertained by trigonometrical observation. Four or five brigs and schooners were placed at the disposal of Captain Reinecke, who commanded the expedition, for the purpose of taking the soundings at greater distances from the coast. By these means the soundings were taken in summer with as much accuracy as has been attained at Cronstadt and Revel in winter by drawing lines on the ice and sinking the lead at intervals along them. The survey of the Gulf of Finland from St. Petersburg to Hongoudd is completed, and the charts (on a scale of 1 inch to 400 yards) are in the course of preparation; some are already in the hands of the engraver.

Operations were commenced in the Gulf of Riga in the spring of 1840. The expedition to which this part of the task has been allotted is at present engaged upon the passage into the gulf between Swalferort and the coast of Courland. A steam-boat has been placed at the disposal of Baron Wrangell, who commands the expedition, with a view to ensure greater accuracy in taking soundings at a distance from the coast; and lofty signal-posts have been erected on shore for the purpose of determining with precision at all times the position of the steamer. As this coast affords no shelter from storms to ships or boats, the nautical part of the operations is exposed to many hazards and difficulties, which will call into exercise all the approved perseverance, skill, and zeal of the chief and of the officers under him. Baron Wrangell is already known to the scientific world as Struve's assistant in his meridian measurement.

Amongst other hydrographical works in progress under the direction of the Imperial government, an atlas of the coasts of the Black Sea is being engraved: the materials have been collected during a series of years by Captain Marganard and other naval officers, by direction of Admiral Greig.

In the autumn of 1839 two Russian miners, Kowolewsky and Gerngross, were sent to Bokhara, at the Khan's request, to search for useful minerals in his territory. On reaching the sea of Aral they were obliged to return to Orenburg on account of the relations then existing between Russia and Bokhara. In the summer of 1841 the Russian government despatched a second mission, at the head of which was placed Butenieff, superintendent of mines. He was accompanied by Bogolowsky, who also held an appointment in the mining service, and the naturalist Zehman. According to the most recent intelligence, Butenieff was still at Bokhara; Bogolowsky and Zehman, under the protection of the government of Bokhara, had reached Samarcand, and penetrated from that city into the Alpine country beyond. On this excursion they have discovered veins of coal.

In the beginning of 1840 the Russian Government dispatched Dr. Schrenk to the Altai to inquire into the natural history of that tract of country. On his journey Dr. Schrenk made several geognostic observations, the most important of which relate to the island-hill Araltüabe, in the lake Alakuli, between Semipalatinsk and Tchugutchak or Tarbagatai. This hill has hitherto been assumed to be of volcanic origin, and Asiatic travellers have even pretended to have seen flames proceed from its summit. Schrenk however visited the island, and found that it consisted of granite and clay-slate (Thonschiefer).

The geognostic observations of Dr. Ruprecht in the peninsula of Kanin are interesting. They prove that the same formations which extend over a wide space in North-west and Central Russia predominate there also. Ruprecht brought from the Indega, the Tsheskaja-Gaba, and some other localities, petrifactions of the mountain-limestone (Bergkalk) and Jura-limestone in good preservation. In the peninsula of Kanin the mountain-limestone is found in contact with rocks, the constituent parts of which are crystalline.

The measures adopted by the Academy of St. Petersburg, for instituting exact observations on the temperature of the frozen soil at different depths in the well at Jakutzk, the details of which were communicated in the Journal of the Royal Geographical Society (Vol. VIII. p. 401), were frustrated by the removal of Mr. Schergin from that place, and his subsequent death. It has now been resolved to fit out an expedition for the express purpose of conducting these observations, and examining at the same time the natural history of the most northern district of Siberia, the peninsula between the rivers Pjassida and Chatanga. This region has only once been visited by men of scientific acquirements, and that more than 100 years ago, by naval officers under the Empress Anne, of whose reports some extracts alone have been

published. Since their time no one has visited the Pjassida or Chatanga, or even penetrated to the north of Turuchansk, except the student Sujew, sent by Pallas to navigate the Jenissei to the sea, who turned back before he had fully accomplished his mission. The importance of a journey in that imperfectly known country had for some time engaged the attention of the Academy, but it was necessary to procure information from Turuchansk before any arrangements could be made. The observations on the well at Jakutzk were postponed until this preliminary information should be obtained, under an impression that it would be advisable to intrust the two investigations to the same expedition.

The result of the inquiries forwarded to Turuchansk, which was received in the course of last summer, clearly showed that it is all but impossible for a numerous party to traverse the regions between the Chatanga and Pjassida, and penetrate to the sea-coast, in summer; and that even for a small party the difficulties are such as can only be overcome by great capacity for the endurance of continuous toil, both of mind and body. It is evident that with these qualifications must be combined extensive and varied information, and a keen interest in the promotion of science, to ensure results of sufficient value to repay the cost and labour of the expedition. All these qualities the Imperial Academy has found united in Professor von Middendorff, of the University of Kiew, the companion of Professor Baer on his journey to Lapland, who readily undertook the expedition. The plan presented by the Academy has received the sanction both of the Emperor and the ministers; and although the professional engagements of Middendorff have rendered some delay inevitable, he is expected to be in St. Petersburg in the course of the summer, and hopes are entertained that he will be able to reach Turuchansk or Jakutzk before the end of next winter.

The objects of the expedition are:—I. To collect information respecting the statistics, ethnography, and natural history of the country between the Pjassida and Chatanga; to reach the coast at one point at least; and to remain there some time for the purpose of acquiring a knowledge of the marine productions at a central point on the shores of the Frozen Ocean.—II. To investigate the phenomena of the temperature of the ground-ice penetrated by the well at Jakutzk; to collect information from other districts respecting the extent, thickness, and formation of the ground-ice of Siberia; to measure the degrees of warmth to which the soil above the ground-ice is raised in summer by the sun, and the water deposited from the atmosphere; to determine the vegetation developed by means of this warmth; to examine the relations existing between springs and the ground-ice; and, in short, to contribute

as much as he can to complete our knowledge of the ground-ice, and throughout the journey to give instructions to competent persons how to make observations in districts which the traveller is unable to visit in person. The journey is expected to occupy three years; the details of the plan are left to be modified by Professor von Middendorff as local circumstances shall render necessary. He will sink a number of thermometers at different depths in the side of the wells, at the close of winter; during the summer he will either sail down the Lena or proceed to Ochotsk, leaving behind him an instructed observer, whose observations he will check on his return. Whether the excursion to Jakutzk or that to the Chatanga be the first undertaken will be decided in Siberia.

It would be out of place to notice here the ulterior objects of this expedition. It ought, however, to be mentioned that a journey to the northern regions of Western Siberia will be commenced at the same time under the command of M. Sjögen, a member of the Academy, the chief object of which is to collect ethnographical and philological information, but which will not omit to procure intelligence respecting the ground-ice. Both expeditions will make a point of directing the attention of intelligent persons to the most important questions bearing upon the phenomenon of ground-ice, with a view to procure information from them either during the course of the journey or at some later period. Instructions how to make the necessary observations have been circulated already, and will be more widely dispersed by the travellers.

In his widely-extended efforts to classify, and bring into comparison with our well-known deposits in this part of Europe, the strata of European Russia, Mr. Murchison, President of the Geological Society, has, by his own labours and those of his companions, Count Keyserling and M. de Verneuil, been able to contribute several data on the physical geography of that country, which will serve to modify certain preconceived views. Count Keyserling has determined by barometrical observations the relative altitudes of more than 100 places in the interior of Russia in Europe, varying from 150 to 1000 feet above the level of the Baltic. A broad and comparatively elevated zone, of an average height of about 600 feet, with summits reaching to 900 and 1000 feet, extends from Livonia to Koursk, and dies away to the S.E. beyond Voroneje. It is the southern portion of this plateau which Mr. Murchison and his friends unexpectedly discovered to constitute a dome of very ancient stratified deposits, separating Western Russia into two very distinct mineralogical north and south basins.

The previous journey of Mr. Murchison to the northern governments

of Russia and to the White Sea had shown that the old yet prevalent idea of the Waldai hills (between St. Petersburg and Moscow) being connected by a line of high lands with the Ural Mountains, *i. e.* by the supposed "Great Ourall" of the learned Henry Müller, is a baseless hypothesis; for the higher grounds in Vologda, &c., which never exceed 600 feet, trend to the N. E., and not eastwards towards the Ural, whilst the watershed between the N. and S. flowing streams, united by the famous line of canal projected by Peter the Great, is occupied by marshes, and has in no respect the character of a continuous ridge.

Of the Ural Mountains, in examining which Mr. Murchison spent three months, he will shortly communicate to the Society some remarks explanatory, in great part, of a beautiful map of the S. Ural, prepared for his use by General Perowski in pursuance of the orders of His Imperial Majesty. This memoir and map, accompanied by a dissertation by M. Khanikoff, will serve to explain many physical features of a tract which, occupied by Bashkirs, and containing little mineral wealth in comparison with N. Ural, has been less examined by competent geographers.

Baron Meyendorff, brother to the author of the 'Voyage to Bucharia,' has written a geographical memoir on European Russia, which, together with a map, has been presented to the French Academy of Sciences.

Aleoutean Islands.—If the few natives of these distant islands seem, at first sight, to possess but little interest for us, nevertheless, as members of the great human family whose history is now engaging so much attention, the knowledge of their language, superstitions, and manners may throw considerable light upon the origin of tribes, their communications, their dispersions, &c. Mr. P. John Venaiminoff, a Russo-American, who has spent ten years in the Fox Islands, has published a grammar of the Aleoutean language, and a description in Russian of the people; some account of which will be found in the 'Bulletin de la Société de Géographie' of Paris.

I have been anxious to enter more at length into the details of these geographical expeditions to Russia, because they relate to parts of the world amongst the least known to those who hear me, because the objects to which they are directed are highly interesting to the physical geographer, and because they reflect honour on the enlightened and spirited Government by whom they are promoted. M. Beguly, a learned Hungarian, who has travelled through Lapland, Finland, and Esthland, for the purpose of comparing the Magyar language with the Finnish dialects, is at present at St. Petersburg, and contemplates an expedition to the northern Ural in the course of the summer, in order to make himself acquainted with the language of the Woguls and Ostiaks.

Admiral Krusenstern, one of the most celebrated modern circumnavigators, has lately sent to us from St. Petersburgh a faithful transcript, made at his own expense, of the Parma Portulano, or Mappe Monde, executed in 1367, by the Pizzigani, Venetian geographers of the fourteenth century.

Netherlands.—The British Government have presented to the Baron G. A. Tindal a valuable gold chronometer, in acknowledgment of the services rendered by that officer whilst collecting materials for a chart of the North Sea, as far as regards the coasts of the Netherlands.

Of the constant changes which are imperceptibly taking place on the surface of the earth, and the modifications of local climate which are produced by those changes, all are not the works of nature. The labours of man, by clearing forests, draining marshes, cultivating hitherto sterile regions, &c., may be numbered among the causes of considerable changes of this description. An undertaking of this kind, and one of very great importance, is the desiccation of the lake of Haerlem in Holland. This gigantic work is at this moment in active operation ; and, however great may be its advantages in an agricultural and commercial point of view, there can be but little doubt that the sudden exhaustion of a surface of about 200 square miles of water will influence the climate and atmospheric moisture of the surrounding country.

Belgium.—Amongst the exertions made by the Government of His Majesty the King of Belgium for the promotion of geography, we may enumerate, in the first place, a scientific expedition under M. A. Ghiesbreght into the southern regions of Mexico. Another under the direction of Messrs. Linden and Finch into Brazil, to the banks of the Orinoco, and in the provinces of Yucatan and Tabasco.

A Belgian company under the auspices of the Government have also sent an expedition under Colonel de Puydt to explore a part of Vera Paz. This company, whatever may be its principal object, has not been unmindful of science, as amongst its explorers are artists, botanists, zoologists, geologists, and geographers. The expedition is now engaged in the exploration of the environs of Lake Izabal, or Gulf de Dulce.

At Brussels the geographical establishment of that zealous and indefatigable promoter of geographical knowledge, M. Vandermaelen, one of our foreign honorary members, continues to publish a variety of important works on the geography, topography, and statistics of Belgium and other parts of the world. His topographical map of Belgium, in 25 sheets, on the scale of $\frac{1}{80000}$, of which four sheets have already appeared, has gained him a gold medal from the Committee of National Industry. He has also published a very valuable mining and mineralogical map of his own country, and other works far too numerous to be here specified.

Germany, &c.—In Saxony the great topographical survey by that Government, which was completed in 1825, continues to receive, from time to time, such corrections as are rendered necessary by local changes. The great cadastral map also of Saxony, commenced in 1834, was completed in 1841.

M. J. G. Wiemann has been for several years engaged in the compilation of a very important map for physical geography. This is a map of the heights in Saxony. The first section will embrace the country round Dresden, between 31° 5′ and 31° 40′ long. E. of Ferro, and from about 50° 33′ to 51° 20′ N. lat. The heights will be given in two divisions, right and left of the Elbe; and they will be laid down with their natural bearings, according to the double scale of longitudes used in the National Atlas of Saxony. Their forms and slopes will be precisely indicated, giving the exact character of the range, and showing the terrace-like distribution of its various ridges, succeeding each other from the principal valley to the highest crest; and the gradual fall of these ridges in an eastern and western direction will be seen at a glance. The sources of the principal rivers in the mountain-chains, as well as the towns and villages, will also be marked.

Germany.—Amongst a variety of publications on geographical subjects which daily make their appearance on the Continent, I beg leave especially to call your attention to a geographical journal, announced by Dr. Luddé of Magdeburg, and of which he has transmitted to us the first three numbers.

A trigonometrical map of Hanover, by Captain Papen, has been published in 63 sheets, on a scale of one inch to three geographical miles.

During the last year were published by the Austrian quarter-master general's department the concluding sheets, viz. 22, 23, 26, 27, and 30, of the special map of Styria and Illyria (Mr. Goeth has also published a description of Styria), on a scale of $\frac{1}{144000}$. A reduction of this map in 4 sheets, on a scale of $\frac{1}{288000}$, is advancing, and will probably be ready by the middle of next month. The surveys of Moravia, Hungary, and Bohemia are also in progress. The triangulation of Hungary was made in 1840, from the river Theis to the river Maros, and towards the frontier of Transylvania; when 46 triangles of the first order were laid down on a base of 4623 *klafter* of Vienna, and measured with an instrument constructed for the purpose on the method of Delambre, but improved. At one of these bases the necessary astronomical operations were commenced. In 1841 two chains of triangles were carried on to the frontier of Transylvania, and 50 triangles of the first order were obtained in the direction from St. Anne in Hungary towards Hermannstadt in Transylvania, where verifications were made by

fresh astronomical observations. Similar triangulations will be carried over the whole of Transylvania. With the consent of the courts of Rome, Florence, and Lucca, a triangulation from the river Po through the Roman State has been executed since last May, and carried on to Rome. This triangulation will be continued to Naples, and will be completed, as well as the survey of the Roman State, this summer, after which the survey of Tuscany and Lucca will be undertaken, and a junction effected with the very well observed triangles of the Padre Inghirami in Tuscany, and the triangles of the first order by the Austrian officers in Lucca, in 1817. These operations will form the basis of a general map of the whole of Italy, on the scale of $\frac{1}{86400}$, which will form the continuation of the general map, already published, of the Lombardo-Venetic kingdom, in four sheets. I may also mention a travelling map of roads and mountains for Austria, Salzburg, Carinthia, Styria, and the Tyrol, to Munich; including the Austrian Alps and high lands of Bavaria, in two sheets, by Schultz; a map of the Schneeberg and the Raxalps with their environs; a chart of the Austrian military frontier, by Pokorny, in six sheets; and more especially six sheets, which have recently appeared, of the environs of Vienna and Baaden; XI. and XII. of which contain the former city. This map is executed in a peculiar manner. It is a lithograph, in which the details are done with chemical ink, and the mountains with the chemical chalk upon the granulated stone; the colours being impressed from stone plates. Schmidt has published a topographical and statistical account of Austria.

Count Karaczay, one of our foreign corresponding members, has sent to the Society a manuscript map of Albania, much more correct than any yet published, accompanied by an inedited memoir on the geography and productions of that country. This will be published in the Society's Journal.

Mr. Jos. Russegger (of the Austrian mining department) has published the first volume of his Travels in Egypt, Syria, Greece, Sicily, Germany, Belgium, England, &c. This is considered a classical work, both as regards extent of knowledge, particularly in a geological point of view, and sound and clear perceptions.

France.—The charts of the coasts of France, under the direction of the Dépôt de la Marine, are proceeding towards their completion. The importance of these charts, not only to the French nation, but to all who navigate along their shores, need not be insisted upon; but amongst many other happy results of this great hydrographic survey, it may be observed that M. Meunier has recently discovered and pointed out the existence of dangerous currents running towards the land off the mouths of the Rhone, on the shallows in the neighbourhood of which vessels are fre-

quently wrecked. In beating up against an east wind, vessels ought, M. Meunier observes, to keep well in the blue water, quite out of the ripple of the waters, and the shallows.

The grand triangulation of the new map of France, under the direction of General Pelet of the Dépôt de la Guerre, will soon be brought to a termination. The secondary triangulation has received considerable extension, and the topographical details have been greatly multiplied. The sixth livraison of the new map, consisting of eight sheets, has lately appeared.

A departmental atlas of France, on a large scale, is in progress. It is to be beautifully engraved on steel.

We have just received from General Pelet the autograph maps of the Departments "de la Seine Inférieure," "de l'Oise," and "de la Seine et Marne:" also the maps of the provinces of Oran, Algiers, and Constantina. In reference to these last I may observe to you, on the authority of Colonel Lapie, Chef de la Section Topographique du Dépôt Général de la Guerre, that the maps of the French conquests on the coast of Africa will shortly be followed by others, corrected by new routes and later observations: we must not be surprised at this, when we learn that, previously to the occupation of these districts by the French forces, nearly the only authorities accessible for geographical notice were the very imperfect maps and descriptions in Shaw's Travels, and the Roman Itineraries.

Colonel Lapie has also enriched our library with a map of the regency of Tunis, on the scale of $\frac{1}{400,000}$, compiled from the notes and routes of Messrs. Falbe and Prisot,—another of a part of Servia and Upper Albania, being $\frac{1}{800,000}$, the result of M. Viquernel's two geological journeys in 1838 and 1839; he has sent us also his map of Turkey in Asia, and Persia, on a scale of $\frac{1}{3,500,000}$. This map, on which Colonel Lapie has been employed for many years, is intended to illustrate both the archæological travels of M. Tessier, and a large work on the botany of the East by the Comte Jaubert. In the engraved copies Colonel Lapie has only traced the routes of M. Tessier, and of the various botanists who have visited the country; but on one of the copies which he is about to address to the Society he proposes to indicate certain useful directions for those who wish to complete the physical geography of Hither Asia. In the mean time Colonel Lapie is occupied on a map of Turkey in Asia, and Persia, on a scale of 1/1,[illegible]00,000, and on another of Turkey in Europe.

M. le Comte Jaubert is printing a narrative of the Travels of the late Aucher Eloy in Asiatic Turkey and Persia. This zealous botanist died at Ispahan in 1838, having brought to this unfortunate conclusion

his fourth journey undertaken in the pursuit of science in that part of the world since 1830.

Messrs. Flandrier and Conte have returned from an archæological and geographical tour in Persia, during which they collected many very interesting details on Persepolis, and various other ancient sites. Amongst the Routes or Itineraries they have brought home are those from Amaret to Kingevar by Ourradgird and Nahavand, from Tabriz to Baghdad by Ouroumiah, Saoulboulat, Schenar, Banah, Suleimanih, and Kifri; also from Djezireh to Diarbekir by the right bank of the Tigris.

M. Daussy, director of the hydrographic department in France, has added four new charts of his Atlas of the Indian Seas to the thirty-two already published. This officer is also engaged on another series of charts and maps for the same part of the world, but on a larger scale; some parts of this latter work have already made their appearance.

The charts composed from the observations of the Astrolabe and Zelée are in the hands of the engraver.

Indeed the activity of the department under the direction of M. Daussy has been so great that we cannot attempt to enumerate all the charts it has published; we may mention, however, that the Scientific Commission of the North, composed of a number of the most learned men in the various departments of science, is publishing under its auspices the relation of the voyages undertaken under its direction, together with a magnificent atlas. The voyages are in Scandinavia, Lapland, Spitzbergen, and the Feroe Islands; the observations are astronomical, hydrographical, botanical, meteorological, magnetical, geological and mineralogical, physico-geographical, zoological, statistical, historical, and mythological; and from the well-known ability of the gentlemen to whom the different departments of the expedition have been confided, we confidently anticipate a very important and highly valuable work.

A new and very useful work, called a *Prototype Geography* of France, is also announced by Colonel Denaix, a gentleman well known by his former valuable geographical labours. This is said to be a succinct *résumé* of Colonel Denaix' exposition of the laws of the co-relation of forms: it further classifies the various orders of streams and mountains, with the several ridge-lines of the latter. From these elements he determines the actual extent and exact configuration of the several departments, so that the enunciation of any fact immediately suggests to the mind, the relation which it bears to the whole system. In addition to this, Colonel Denaix is about to publish the last part but one of his political and historical atlas of France.

Switzerland.—The grand survey of Switzerland is going on steadily

under the direction of Colonel Dufour. It is to be in 25 sheets, on a scale of $\frac{1}{50,000}$, and will be engraved on half that scale. Some of the cantons have, however, their own maps separately engraved on the larger scale. The portion of this highland district already surveyed are the Bernese Jura, Argovia, Thurgau, Neuchatel, Vaud, a part of Fribourg, Geneva, the S.W. portion of the Bernese Alps, and the western half of the Valois. The drawings of the Alps of Berne between the Gemmi and the lake of Geneva is said to be of great beauty.

Spain.—In Spain a special commission has been formed for the construction of a new map of the kingdom, with the materials already collected, but dispersed amongst the various establishments of civil and military engineers, the hydrographical dépôt, and the department of roads, canals, bridges, &c. The chief object of this map will be to make the territorial division of the provinces conformable to the late enactments of the Cortes.

An enlarged and corrected edition of the Geographical, Statistical, and Historical Dictionary of Spain, published by Migrano in 1826-1829, is preparing by Don Parval Madoz.

We have also from the Madrid press, during the last year, maps of the west coast of Africa from Cape Bojador to Cape Verga, comprising the Cape de Verde islands; one of the Straits of Carimata, between the islands of Billiton and Borneo; of a part of the Gulf of Guinea, from the River Benin to the Cape Lope Gonzalos, with the islands of Fernando Po, Principe, St. Thomas, and Annobon. A map of Puerto Rico i also in the hands of the engraver; and we may shortly expect from the same quarter a map of the coast of Africa from Fremecen to Bugia, including the coast of Spain from Aguilas in Murcia to Denia in Valencia, with parts of the islands of Hiza and La Formentara; and likewise a chart of the south coast of Africa from the 24th to the 40th degree of S. latitude, and from the 17th to the 46th degree of longitude east of Cadiz.

Portugal.—Don Diego Köpka, professor of astronomy at the Polytechnic Academy of Oporto, is engaged in publishing the works of Don Joaõ de Castro, which will contain his two nautical Diaries, from Lisbon to Goa, and from Goa to Dio; the last may be called a Survey of the coast between the two places. We may expect also shortly to have from the same hands a more authentic transcript than has hitherto appeared of the Livro de Duarte Barbosa, containing full details of the state of Portuguese discovery and commerce in Eastern Africa and in Asia, previous to the year 1521.

A map of the course of the Douro from the Spanish frontier to the sea is in the course of preparation, on the scale of one Portuguese league

to four inches English. It will be accompanied by a map of the surrounding wine-district on the same scale. A map of the Algarve provinces has just been published at Lisbon by Sr. Baptista Lopez.

Viscount de Santarem, one of our foreign corresponding members, has published an atlas of *fac-similes* of ancient maps of Africa, in order to elucidate by the most authentic documents the priority of the discovery of the Portuguese on the western coast of Africa beyond Cape Bojador. Of this interesting atlas the Viscount has obligingly promised us a copy. He is engaged in the publication of a coloured copy of the Mappe Monde attributed to *Sauerte.* The description of Guinea by André Alvarez d'Almanda in 1594, of which only an extract had been previously published, has been brought out at Oporto.

The Academy of Lisbon has published the second volume of the Travels of Ibn Batuta; and under its auspices will now appear a reprint of a most rare book, the Account of the Discovery of Florida, written in Portuguese in the year 1557; as also another volume of Noticias para a Historia e Geographia das Nacias Ultramarinas, &c., containing the labours of the Portuguese and Spaniards for determining the limits of their respective possessions in America.

Naples.—The great military and topographical map of the kingdom of Naples, laid down geometrically on the scale of $\frac{1}{20,000}$, and published on the scale of one-fourth, or $\frac{1}{80,000}$, is making a rapid progress under the able direction of Colonel Ferdinando Visconti. In the year 1840 the triangulation of the first order in the course of this service was carried along the Calabrias, and the north coast of Sicily, as far as Palermo and to Sciacca. In 1841 the same triangulation was carried along the parallel of Naples, for the purpose of measuring an arc of the parallel to the extent of about $4\frac{1}{2}°$ between the island of Ponza and Farano in Bari near the Adriatic. The next step will be to measure another parallel arc of 4°, between the island of Maretimo in Sicily and Cape Spartivento in Calabria; as likewise an arc of the meridian of about 5° between the island of Tremiti and Cape Passaro in Sicily.

Colonel Visconti proposes also in the course of the present year to institute a series of observations for ascertaining in what quantity, and in what direction the mountain of St. Angelo, near *Castelamare*, elevated above the level of the sea about $\frac{3}{4}$ of a mile, attracts the plumb-line, and causes it to deviate from the perpendicular. It has also been observed that the volcanic soil in the neighbourhood of Naples suffers partial changes of level, at long intervals of time: Colonel Visconti proposes therefore to determine exactly by a repeating circle the difference of level between points permanently marked, and fixed at a small height above the sea, along the whole extent of the coast from Ischia and

Procida, along the Gulfs of Pozzuoli and Naples as far as Amalphi, round by Sorrento and the Point of the Campanella; the operation to be repeated every ten years. Colonel Visconti will forward to the Society a report of the operations of the survey.

A topographical and hydrographical map of the Faro of Messina, on a scale of $\frac{1}{1000}$, is in progress: the topographical part of it will be completed this year; the soundings of the coast will be taken in 1843. The Topographical Office of Naples has also published exact plans of the cities, environs, and ports of Brindisi and Trapani; and the first sheet of a hydrographical map of the Mediterranean, in three very large sheets, for the use of the navy, will be engraved this year. The King has ordered six new sheets of the great map, comprising the Royal gardens of *Caserta*, the old hunting-grounds of *Mandragore*, and the course of the river *Volturno* from its confluence with the *Calore* to the sea.

Connected with the great triangulation now in progress in the kingdom of Naples is the construction of the chorographical map of all Italy, on the scale of three lines to 1000 toises: Austrian engineers hav- been sent by the Emperor, with the consent of the Pope, into the Papal States, for the same purpose. This will be connected with the triangulation of Tuscany made some years ago by the astronomer Inghirami.

I have likewise to mention, to the honour of the Neapolitan Government, that they have just completed the illuminated engraving of an ancient hydrographical map of the Mediterranean and Atlantic, which includes the Canaries, Azores, coasts of Spain, France, England, and a small portion of Ireland. The original, which is on parchment, and belongs to the Royal Bourbon Library at Naples, appears to be a Catalan work of the first half of the 15th century.

Tuscany.—At Prato, in Tuscany, Mr. T. Marmocchi is editing an elegant and splendid collection of Travels and Voyages from the discovery of America down to the present time. The narratives already published are the Voyages of Columbus, 3 vols. 8vo., and the Wanderings and Remembrances of Marcellus in the East, 1 vol., with notes, plans, maps, portraits, and landscapes. There will be altogether of this work about 16 volumes.

Mediterranean.—Mr. Keller has published a chart of that part of the Mediterranean between Sardinia, Italy, and Sicily. The south coast of Sardinia, and the bank lying between Sicily and Pantelleria, have been explored by Messrs. Jurien and Daroudeau. These may be regarded as complementary to the beautiful map of Sardinia by Colonel de la Marmora, already in the possession of the Society.

The second edition of Colonel Leake's Topography of Athens, which

was published last year, contains many very valuable additions to this standard work, on a subject which will ever interest the antiquary and the historian. The operations which are still being carried on, within and around the ancient city, for the demands of the present government and population, have given rise to many discoveries of importance for fixing ancient localities; and Colonel Leake has brought to bear on this part of his subject all that spirit of honest inquiry and just discrimination, which distinguishes his other topographical and geographical publications.

Greece.—Mr. William Mure's Journal of a Tour in Greece and the Ionian Islands treats chiefly of the author's observations on the present state and the classical antiquities of Hellas: but in it the reader will find many very valuable geographical notices relating to the peculiarities of its rivers and mountains, as well as the verifications of some sites of ancient towns. The plain of the Achelous in Acarnania, those of Phocis, Platæa, and Marathon, the valleys of the Eurotas and the Alpheus, have received from the pen of this graphic traveller very appropriate development: but the principal charm of the book is derived from the warmth of feeling, and correct, chastened judgment, with which he illustrates the poets of antiquity, particularly Homer, by a comparison with the actual appearance of the country, and the manners of the inhabitants.

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Mr. Kiepert, of Berlin, has in hand an atlas of Greece, of which 8 sheets are already published.

The general triangulation of this country, by the French engineers, has been extended to the Ionian Islands, and is thus connected with that of the more western part of Europe.

Asia.

Asia Minor.—Since we last met in this room Mr. Charles Fellowes has published an Account of Discoveries in Lycia, being a Journal kept during a Second Excursion in Asia Minor in the year 1840. To the

contents of his former work Mr. Fellowes has added several new routes, and particularly a fuller inspection of the coast of Lycia from Macri eastwards, and to Side in Pamphylia. It contains also a map beautifully executed.

Besides much new geographical information to be derived from Mr. Fellowes's visit to this not remote, but almost unknown, corner of that continent, the lovers of ancient art may expect to be gratified very shortly by the arrival in this country of a large collection of sculptured marbles from the ruins of Xanthus, which are said to be in a high state of preservation, and to rival in beauty, style, and composition the Elgin Marbles. Another instance this of the manner in which one pursuit helps on another, one science is the handmaid of the rest. The traveller in search of unknown districts, amidst a semi-barbarous population, lights upon works which would have thrown lustre on the most polished nations. In this case, too, Mr. Fellowes has had the good fortune to discover a variety of inscriptions in the Lycian language, hitherto a totally unknown dialect. This may, it is hoped, open new channels of inquiry into the ethnological characters of the ancient tribes who inhabited Asia Minor before they were invaded by the arms and literature of Greece. The geography of Lycia has also received very important illustrations from the excursions of Mr. R. Hoskyn, master of her Majesty's ship Beacon, whose narrative, accompanied with a map, has been recently communicated to us by the kindness of the Lords Commissioners of the Admiralty.

But Asia Minor, as a portion of Hellas, is an inexhaustible source of discoveries of this description. Of its physical geography, as rigid geographers, we still know comparatively little. But at every step our travellers make in that favoured part of the ancient world, they are sure to reap a rich harvest of topographical, geographical, and archæological knowledge. I must not be deterred on private considerations, whilst enumerating those to whom we are most indebted for information of this nature, from inviting your attention to the Travels in Asia Minor by Mr. W. J. Hamilton in the years 1836 and 1837. This traveller has brought home a large mass of Greek inscriptions, many of them indicative of ancient sites. In his way to Cars and Anni, on the confines of Turkish Armenia and Georgia, he visited the silver mines of Guinesh Khana. On his return along the south coast of the Black Sea, he identified some of the cities mentioned by Xenophon and others, the abode of the Chalybes, east of the Thermodon; the junction of the Iris and Lycus; the rock-salt mines on the confines of Pontus and Galatia; the antiquities of Tavium in Galatia; the site of Pessinus; and the quarries of Synnadic marble: and returned to Smyrna by Antioch,

Pisidia, Sagalassus, and Colossæ; at this last spot the Lycus disappears in a deep chasm. During the winter he visited the coast, the island of Rhodes, and the gulf of Syme.

On a second occasion he explored Cyzicus, and the course of the Macestus to its sources, Ancyra in Phrygia, and the extraordinary volcanic district of the Katakekaumene, thence to Iconium, the Fountain of Midas, the salt lake of Kodj Hissar, the course of the Melas; and ascended the heights of Argæus. After having discovered the ruins of Isaura, he endeavoured to penetrate to the south coast, but was prevented by the plague.

The narrative of this tour will be accompanied by a very beautiful map engraved by Mr. Arrowsmith, and which will contain the latitudes of between fifty and sixty places laid down from actual observations.

The hydrography of the Kizil Irmak, the ancient Halys, as first suggested by Mr. Hamilton, and afterwards corroborated by Mr. Ainsworth, has since been proved beyond a doubt by Mr. de Civrée. It thus appears that the Kara Sú, and not the Tokma Sú, is the Melas of Strabo, and that accordingly, when this geographer is made to say that the Melas falls into the *Euphrates*, we ought to read "into the *Halys*."

Mr. Ainsworth, our late traveller in these countries, and whose visit to Kurdistan is given in the 11th volume of our Journal, has lately edited his Travels in a more extended form, the utility of which is enhanced by our having given him permission to make use of the maps prepared at the expense of the Society, to illustrate various papers in our Journal.

M. Kiepert of Berlin, accompanied by Mr. Law, naturalist, M. Schoenborn, philologist and archæologist, and Dr. Berends, (natural philosopher,) are now exploring the still imperfectly known districts of S.W. Asia Minor, especially Caria, Lycia, Pamphylia, Pisidia, and Cyprus, with a view to add the results of their trigonometrical and astronomical observations to the survey of Phrygia, Lyconia, Cilicia, and Cappadocia, executed, in the years 1838 and 1839, by the Prussian officers in the service of the Porte (now in progress of publication). They propose also to explore the antiquities of the S. W. coast of Caria, first discovered in 1839 by Mr. Fellowes.

Turkey in Asia.—The Itineraries of Captain Beaufort (of the French Engineers) in Asiatic Turkey and Persia, based upon astronomical positions, have been completed, and, together with the labours of M. Trouillier, furnish valuable chorographical data.

M. Engel has published a work on the island of Cyprus.

Palestine.—Major (now Lieutenant-Colonel) Napier has given the society an account of two excursions in Palestine, from Tyre and from

Jerusalem, in the course of which he visited Naplouse, the ancient Sechem, capital of Samaria, Hebron, and the valley of the Jordan. This river was crossed at the bridge between Tiberias and the Dead Sea, and from thence the party visited the trogodolyte village of Om Keess on the slope of the eastern hills.

Dead Sea.—Various opinions have of late been held and maintained on the degree of depression of the Dead Sea below the level of the Mediterranean; but it is now placed beyond doubt, having been ascertained by the boiling of water, by barometrical and by trigonometrical operations. Messrs. Moore and Beek were the first to draw attention to the subject; in the spring of 1837, they concluded from the temperature at which water boiled, that the Dead Sea was between 500 and 600 feet below the Mediterranean. Professor Schubert, of Munich, in the same year, made the depression 598·5 feet by barometrical measurement. Mr. Russiger, an Austrian naturalist, made it 1400 feet, also by barometrical measurement. M. Berthou states it from his barometrical observations to be 1332·46 feet, while calculations from the data furnished by the late Sir David Wilkie make it 1200 feet. It will be perceived that, while all these statements confirm the fact of a great depression, they state its amount very differently. Indeed, as Dr. Robinson very justly observes in his 'Biblical Researches in Palestine,' "the question could never be decided with exactness but by means of a line of trigonometrical levels between the two seas." Fortunately this has now been effected by Lieutenant Symonds of the Royal Engineers. This officer, during the course of last year, carried a line of levels across from Jaffa to the Dead Sea by two different routes; and the results, corresponding to within an insignificant fraction, give 1311·9 feet for the depression of the Dead Sea below the level of the Mediterranean, being a very few feet less than that given by M. Berthou. Lieutenant Symonds by the same operations found the level of the lake of Tiberias to be only 328 feet below that of the Mediterranean, making an inclination of nearly 1000 feet between this lake and the Dead Sea, a distance of about 70 miles: this latter tract has never been explored.

We may shortly expect to receive the further details of Lieutenant Symonds's triangulations through this important tract of country. In the mean time it may be interesting to the Society to learn that the district portioned out to Lieutenant Symonds had been the part of Syria south of Cape Bianco, near Soor, to Djezir Jashoob, *viâ* Saffet. He was furnished with an excellent seven-inch theodolite, and, after revising with it the triangulation of the northern district, which he had commenced with a five-inch instrument, he went south, and measured a base from the Martyr's Tower near Ramleh, on the plain of Jaffa, on which he founded

his triangulation for the south portion of his district; and, finding the instrument sufficiently nicely divided in its vertical arc, he was enabled to ascertain the relative levels of his various points with great accuracy. He then worked with his triangulation towards the head of the Dead Sea, taking at every station a very accurate series of vertical angles, the mean of which he worked on, making the necessary allowances for refraction and curvature; but, owing to the want of another instrument, and a competent person to take simultaneous observations, he could not ascertain what the former was, and had to assume it at $\frac{1}{12}$ of the subtended angle from the earth's centre, which he considers to be very near the truth. Lieutenant Symonds completed the levels in this manner by two different lines from Jaffa to Nebi Samuel, the highest point of the Jerusalem range, the one checking the other, and found the difference but trifling. From thence he started on the same plan to the Dead Sea, and with nearly as good success, the two levels differing from 11 to 12 feet. Owing to the unfavourable nature of the ground about Jerusalem, and the cliffs overhanging the plain of Jericho, Lieutenant Symonds could not carry the two lines of level, independently of each other, to the required spot, which might have been done in spite of the natural difficulties, had he had better assistance than he could procure from Bedouins. The work occupied him nearly ten weeks, though the distance traversed was not more than 47 miles: the direct distance from Jaffa to the Dead Sea; though round by Nebi Samuel, Jerusalem, &c., it will be nearly 52 miles.

Arabia.—The Society has been favoured by Baron Koller with an account of a new and but little known route from Mount Sinai to Akabah, with a map. As the paper has been read to the Society, I need not here enter into its details. A chart of Kooria Mooria Bay, on the south coast of Arabia, has been published by the East India Company.

Euphrates.—On the subject of the expedition fitted out in 1836, under the command of Colonel Chesney, to ascertain the practicability of navigating the Euphrates, I have the pleasure to state to you that, after that officer's return in 1837, three steam-vessels were prepared by the East India Company, and sent out in frame to Basrah, where the Nimrúd, Nitocris, and Assyria were put together under the directions of Captain Lynch of the Indian Navy, whose force, including the steamer left by Colonel Chesney, was thus increased to four vessels, with an adequate establishment of officers and men.

After several voyages up and down the Tigris, with mails and despatches, Lieutenant Charles Campbell, of the Indian Navy, who was in command during Captain Lynch's absence from bad health, commenced the ascent of the Euphrates with two of the vessels. The Nimrúd,

Lieutenant Jones, and the Nitocris, Lieutenant Grounds, left Bagdad the first week in April, 1841, and on the 31st of May both vessels safely reached Balis, the ancient river-port of Aleppo, 45 miles from that city; which, being the nearest point to the Mediterranean (110 miles), had been fixed upon during the previous expedition as the most desirable starting point. The distance thus accomplished by Lieutenant Campbell was 1130 miles from the sea, and the time occupied was 273 hours or 19½ days. The two vessels steamed through the Lamlúm marshes, and upwards, passing in succession Hillah, Babylon, Hit, El U's, Hadisa, 'Ana, the river Khabur, Deir, Rakka, and Thapsacus, on to Balis, without any casualty whatever. Tamarisk was cut for fuel as required, by the Arabs, who proved to be as friendly on this as on all preceding occasions. The chief difficulties encountered were from the strength of the current, caused by different parapet walls, constructed in the river to raise the waters for the purpose of irrigation; but which might be partially or wholly removed at certain places, so as to make the navigation as well suited for commercial purposes as it is elsewhere. Captain Lynch found the vessels at Balis, and is now engaged on a survey of the lower part of the river.

Colonel Chesney's Geographical and Historical Account of the Countries bordering upon the River Euphrates is now going through the press. It will contain 148 illustrations of the scenery of the East, and 13 sheet maps, showing the course of the Euphrates and Tigris in addition to some of the countries eastward and westward of these "bordering streams."

Persia.—Mr. Layard has forwarded to us a paper in which he reports his success in reaching and examining with some minuteness the Bachtiari Mountains. He crossed the highest part of the great chain Mungasht, and, having reached Cala Tul, proceeded to Manjanik, where he did not find the mounds mentioned by Major Rawlinson, but ruins similar to those of other Sassanian cities. He describes the Abi Zaid, which flows through these ruins, as uniting with a much larger stream, the Abi Allah, having its source near the Kala Allah. In the neighbouring mountains there are cuneiform inscriptions, and the plain of Mel Amir contains ruins of two descriptions: that is, Sassanian ruins, and the ancient mound. The Shekafli-Salman of Major Rawlinson is to the west of Mel Amir, and not on the road to Susan. Mr. Layard copied a cuneiform inscription of a tablet adjoining the natural cave, it being the only one of four that was not completely effaced. The valley of Karan is separated from the plain of Mel Amir by a high ridge of hills. At Susan there are scarcely any remains which would indicate the site of a large city. The tomb of Daniel is a modern building of

rough stones; but held in great veneration. The Karoon is here a fine broad stream, remarkable throughout the country for the excellent quality of its water. Mr. Layard heard of another Susan in the mountains to the N. E. of the place he visited, and which is called, for distinction's sake, Susan-sir-Aub.

Kurdistan.—The attention of the Society has already been called to the value of Dr. Robinson's Researches in Palestine. We are also indebted to another enterprising and zealous American gentleman, Dr. Asahel Grant, for some valuable information respecting that part of the mountains of Kurdistan which is inhabited by the Nestorian Christians. In the course of his journey through this country, from Mosul and the ruins of Nineveh to Ooroomiah, west of the lake of that name, Dr. Grant visited Akra and Amadieh, Bameriza and Julamirk on the banks of the upper Zab, and Bashkala in the country of the Hakkary. Dr. Grant's principal object in the course of this expedition having been to visit the Nestorian Christians scattered over the mountains of Kurdistan, and to ingratiate himself with the inhabitants by the practice of medicine amongst them, he was unwilling to create jealousies by paying too great attention to the physical geography of the country. But in an ethnological point of view his book is highly valuable: he describes the Yezidis, between the Burnedias or Havri, the Zab and Tigris rivers, with a system of worship composed of Sabianism, Judaism, and Manicheism, as kind and hospitable to him as a Christian. But Dr. Grant chiefly dwells on the present and past state of the Nestorians, and he has displayed considerable powers of historical and philological criticism in bringing together a variety of arguments to prove that they are the lineal and direct descendants of the Ten Tribes of the Captivity. The points of resemblance which are most successfully brought forward are—1st. The locality, being identical with that in which we learn from the Scriptures that the captive tribes were first located, and from which there is no reason to suppose they were ever removed; 2nd. Their language, inasmuch as, while all around them speak Turkish, Arabic, or Persian, they still express themselves in the pure Syriac, or Western Aramæan, being the language which they brought with them from Samaria and the northern districts of Palestine; 3rd. Their being a distinct people confined to this particular district; 4th. Their observance of many injunctions of the Mosaic ordinances, such as sacrifices of animals, the offering up of vows and promises to God, the presentation of first fruits, the use of a sanctuary, abstinence from prohibited meats, and other Jewish rites and customs: we may add also strong physiognomical resemblances, their entire freedom from, and abhorrence of, every species of idolatry, the preservation of a great variety of Jewish names,

and the very general conviction amongst themselves that such is their origin. We understand that measures are still in progress for establishing an American mission in the very heart of this country at Julamirk. Although we have no right to expect from these bodies any direct and positive addition to the strict physical geography of the countries they visit (for a too minute attention to these points might essentially interfere with their success), yet indirectly we are sure to receive from them very important accessions to geographical and ethnological science.

We are much indebted to the very learned Professor H. H. Wilson, author of 'Ariana Antiqua,' containing a descriptive account of the antiquities and coins of Afghanistan, for a full and satisfactory memoir on the successive fortunes, and the comparative geography of the country lying between Persia Proper and the Indus. It is *full*, inasmuch as it places in juxtaposition the most authentic recent accounts of Afghanistan in its most extended sense, both with the earliest Oriental authorities and with the data given to us by ancient writers; and it is as *satisfactory* as can be expected under the twofold disadvantage of none of the writers of antiquity, whose works are now extant, having had any personal knowledge of the country, and of the partial and imperfect manner in which modern travellers have as yet explored it. This last source of information is still limited to a certain number of routes, more or less accurately laid down; and we must I fear have to wait many years before this very interesting portion of the Asiatic continent can be thoroughly investigated. The same observations apply with still more force, as all contemporary documents have perished, to the latter portion of Professor Wilson's 'Ancient Notices of Ariana,' in which he has thrown much light on the line of Alexander's march from the Caspian Gates, or the Gaduk Pass, at the S.E. angle of the Caspian, through Hyrcania and Parthiana, to Meshed; and through Asia Proper to Herat, or Alexandria in Aris; thence, avoiding the rugged and difficult country, through Parapomisus, or the hilly district of the Hazarés, southward to the great lake of Zara, in which the Helmund loses its waters; along the banks of this river, through the country of the Drangæ and the Euergetæ, by Candahar and the Arachotis, to Ghiznee; thence to Cabool, the ancient Ortospana, ἡ ἐκ Βακτρῶν τρίοδος; thence by the passes of the Hindoo Koosh, perhaps Bamian or Beghram (whichever may have been Alexandria ad Caucasum), to Khooloom, Magar, and Balkh, the ancient Bactria. From this neighbourhood the Professor conducts the Macedonian conqueror across the Oxus to Marycanda or Samarcand on the Kohak river, and through Sogdiana to Alexandria or Cyropolis on the Jaxartes. On his return southwards (after passing three years

in subduing the strong cities founded by Cyrus), and on his way to India, Mr. Wilson traces his march from Kohistan, north of Cabúl, to Plegerium or Nagara, nearly identical with Jelalabad; from whence the course is N.E. to the foot of the mountainous district of the Himalaya (which in Lieutenant Wood's map is described as the southern range of the Hindoo Koosh) by Arigæum and Mazaga (still to the north of the Cabúl river), to Aornus and Ora on the Indus, 30 or 40 miles above Attock.

Professor Wilson has also treated very ably and succinctly the long *vexata quæstio* of the alleged ancient course of the Oxus, or at least one *branch* of the Oxus, emptying itself into the Caspian Sea; and he is of opinion (from a careful comparison of the authorities cited in Strabo and in Pliny, with the most authentic recent accounts of the great desert between the Atrek river and the lake of Aral) that in ancient times a southern branch of the Oxus was conveyed through this said district in a line south of Kwarizm into the Caspian, north of the gulf of Balkan; and that thus credit may in great part be given to the assertion of Strabo (on the authority of Aristobulus), that the Oxus was one of the great channels of communication, for the purposes of trade and war, for a large portion of the route between the Indus and the Black Sea.

Seistan.—Major Rawlinson, already so well known for his valuable contributions to our Journal, has availed himself of his residence as political agent at Candahar, to commission Dr. F. Forbes, in the summer of 1841, to visit the province of Seistan, the lake of Zurrah, and the lower basin of the Helmund river, the Hermandus or Etymander of the ancients. From the scanty information we have hitherto received of the result of the expedition, it appears that Dr. Forbes was apparently received and welcomed in the most friendly and hospitable manner by the several chiefs of the districts through which he passed; but the too open and undisguised manner in which he collected information, and in which he required from the inhabitants the most minute geographical and statistical details, ultimately excited so strong a conviction of the sinister purposes for which they supposed he was visiting their country, and this connected with the recent advances of the Indian army into various districts of Beloochistan and Cabool, that at the very moment of recrossing the Seistan frontier he was barbarously murdered by Ibrahim, khan of Ichanabad; and up to the present period we have no account of any of his memoranda or drawings having been rescued from the hands of his despoilers.

We are glad to learn, however, from Major Rawlinson, that the accumulation of materials of positive geography in the countries west of the Indus was going on steadily and satisfactorily, and we may hope, with

him, that the Indian government will not delay to make them public. In the mean time Major Rawlinson had satisfied himself with regard to several points of comparative geography between the line of the Hindoo Koosh and the sea. Amongst others, that a spot in the Ghilzie district, south-east of Kandahar, now called Silân Bobât, or Shetin Tóbak, is on the site of the Arachosia of Eratosthenes and Strabo; that the Massagetæ spoken of as adjoining to this city were the Sacæ, a Scythian horde, who from the "populous north" settled in the Hazareh mountains in their transit from the Hindoo Koosh to Sacastan or Seistan: the town of Kandahar he considers to occupy the site of Alexandropolis, and the ruined city of Beghram, north of Cabúl, to be the representative of Alexandria ad Caucasum, subsequently called Eucratidia, from one of the early kings of Bactria. Cabúl itself he considers to be the ancient Ortospana, which means "the white camp," or the "white people;" and Ghiznee to have succeeded to the Γαζος of Stephanus, as Dadúr at the fort of the Bolan Pass may have been the Τρουνδαδες of the Byzantines.

I may mention here, as connected with this country, now so much an objection of attention, that during the course of last year's campaign Major Sotheby, of the Bengal Artillery, observed in the upper part of the Bolan Pass seams of coal laid bare by the erosion of the water.

At the close of the posthumous work of the late Sir A. Burnes, to which I have already called your attention in paying the tribute of regret due to the memory of that distinguished member of this Society, the inquiring reader will find two very remarkable appendices: the first by Sir Alexander Burnes, being his report on the establishment of an entrepôt, or fair, for the Indus trade; into this paper have been condensed the results of Sir Alexander's researches, whilst on the banks of the river, on the condition, number, and character of the native Lohanee Afghan merchants; the principal routes by which they traverse the parallel ranges of the Tahti Soliman mountains, to exchange the goods of the East for those of the West; the various positions on the river best adapted for the establishment of the proposed mart, with the peculiar advantages and inconveniences of each; the seasons to be preferred for the assemblage of the dealers, the force necessary for the protection, the nature and degree of superintendence to be required, and the regulations necessary for the preservation of order, life, and property. Sir Alexander is of opinion that upon the whole the position of Dera Ghazee Khan, on the upper Indus, is the most eligible. This is in itself a thriving and manufacturing place, and it leads to the commercial towns of Múltan and Bhawalpore, which are near to it and to each other, and which now furnish many articles for the Cabúl market. The soil round it is fertile,

the necessaries of life cheap, and it is not liable to be flooded by the Indus. It is also about equidistant from Umritsúr and the opulent town of Shiharpoor in Sinde; so that Dera Ghazee Khan embraçes not only the trade of the Punjab and India, of Candahar and Cabúl, but of the more remote capitals dependent on them, Herat and Bokhara.

The second appendix, affixed to the same work, is a Report on the river Indus, by Lieutenant John Wood, the officer of the Indian navy, to whom the council awarded last year one of the Society's medals. The source of the Indus is still a problem to be solved. It is only *known* to be navigable a few miles above the fortress of Attock, abreast of which the many branches into which it had been divided unite. One deep, narrow, clear, blue stream flows rapidly among hilly groups as far as Kalabagh, where the navigation really begins. At Mukkud the channel widens and is less deep; it soon enters a level country, through which it flows to the sea, with the Soliman mountains on one side, and the Indian desert on the other. From Attock to the sea the river line is 942 miles, and its mean width about 680 yards. In the driest season of the year, 9, 12, 13, and 15 feet are the usual measure of depth below Attock. In this very interesting Report the reader will find the able author's views respecting the mode of navigating the Indus, the prevalent winds and weather in the valley, the boats now in use, and what would be the best adapted for more extended commercial purposes; the expediency of steam-vessels, their draught, which, on account of the shifting of the bed and frequent shoals, ought not to exceed, when laden, 30 inches; the relative value of wood and coal; with various observations on the soundings, and the latitudes and longitudes of places on the banks.

Captain Wilson, of the Nizam's army, has communicated to the Society some very detailed itineraries in Southern India.

The surveys completed, or in progress, by order of the Court of Directors of the East India Company are as follows:—During the year sheets 75 and 77 of the Indian Atlas have been published. No. 107 is in the engraver's hands. We understand the surveys have been completed for No. 79. That of the harbour of Mergai has also been published. Those of the sea face of the Sunderbunds, of the Chittagong river, and of the coast and soundings from Point Palmiros to the Hoogly, by Captain R. Lloyd, are engraving, and will shortly appear. The survey of the western coast of Cheduba, and the islands and shoals south of it, has been completed by Captain Halstead, R.N. That of the gulf of Manaar, by Mr. J. J. Franklin, is in a forward state. The survey of Cashmere, with its passes, Ladak, and Little Thibet, the mountain course of the Indus and the Alpine Punjab, by G. T. Vigne, Esq., will be out in a week.

Mr. J. Walker has published a map of the countries on the north-west frontier of India.

The first three sheets of a map, in Dutch, of the Dutch possessions in the Indian Archipelago, by the Baron von Derfelden de Hinderstein, have recently appeared: an analytical memoir is attached to it, drawn up by the Baron Tindal.

Lord Colchester has caused to be engraved a chart of the route of Lord Amherst's embassy in the year 1816 along part of the Yan-tze-kiang, on a scale of $m. = 0 \cdot 1$.

AFRICA.

Niger Expedition.—Her Majesty's Government, as is well known, sent out last summer an expedition to the mouth of the Niger, consisting of three steam-vessels of light draught of water, constructed for the purpose, and placed under the command of Captain Henry Trotter. The main object of the expedition was to open a communication with the chiefs in that part of Africa, with a view to the establishment of a friendly and commercial intercourse with the inhabitants, which might lead to the extinction of the traffic in slaves. Instructions were given to take the steam-vessels up the Niger and its tributary streams as far as they should prove to be navigable; and afterwards to visit in open boats, or by land journeys, the countries which could be conveniently reached, and to send explorers in any direction which might be thought advisable. Much was therefore naturally anticipated in the way of geographical discovery, particularly in an easterly direction towards the sources of the Tschadda. But the disastrous sickness which unhappily visited the expedition, commenced when it had only been a few days in the Niger, and arrested its progress before it had arrived as far as had previously been ascended by steam-vessels under Lander and Becroft.

Egga, about 340 miles from the sea, was the farthest point reached on the Niger, and there was no opportunity of reaching the Tschadda. The banks of the river above the delta were proved to be less fertile than was expected. A favourable spot, however, was found on the right bank, immediately opposite to the confluence of the two rivers, where a party of civilized blacks from Sierra Leone were landed, under the superintendence of an experienced planter from the West Indies, and a small farm establishment was erected at the expense of some gentlemen in London, for the purposes of stimulating the natives to improvement in agriculture, and of ascertaining the capabilities of the soil. Should this little band of colonists, who have been left here with a small vessel for their protection, have determined to remain, and be able to maintain

their footing, and keep up an intercourse with the coast, we may hope that ere long the settlement will be a point from which the Tschadda may be fully traced and further discovery made.

Above the town of *Eboe* or *Ibu*, or rather Abóh * (which last is the proper name of the town as well as of the country in which it is situated) the only diverging branch to the sea was a very small one, 2 or 3 miles above that place, said to lead to Bonny, and believed to be only navigable by canoes. The two principal branches to the sea may therefore be considered, one by the Nunn, falling into the Bight of Benin, and the other into the Bight of Benin near the town of Warra, which latter branch was navigated as far as that place by Captain Becroft, of the Ethiope.

The King mountains, or rather hills, through which the united streams of the Niger and Tschadda flow to the sea, were estimated not to have an elevation of more than 1200 or 1500 feet above the river, and they appeared to be in groups, rather than to form a range chain.

It may be remarked that the Niger was not called Quorra or Kowarra between Egga and the sea, the usual appellation being the native word for *water*, according to the dialect of the place. At Iddah the Niger was called the *white* water, and the Tschadda the *dark* water, in allusion probably to the muddy appearance of the one, and the comparative clearness of the other, at particular seasons of the year.

The best chart map of the Quorra or Niger river is still that by Captain William Allen, which has been published by the Admiralty. This Captain Allen, previously to accompanying the late expedition as Commander of the Wilberforce, had been up the river with Lander in 1833-4, when he made a survey of the Quorra and Tchadda under very great disadvantages, but which proved on this occasion to be very correct.

Western Coast.—Through the kindness of Messrs. Jamieson, of Liverpool, we have received an account of Benin as described by Messrs. Moffat and Smith : it appears, however, to be neither extensive nor important. Cotton-wool is said to be indigenous to Benin, and is spun and wove into cloth by the women. Sugar-cane is also of good quality : the soil is laid out in square plots, producing yams, plantains, cassada and Indian corn. The country between Gatto and Benin is finely wooded, and, in some places, is very beautiful. Of greater interest is Captain Becroft's ascent of the Niger, in the '*Æthiope*' steamer, furnished by the same gentlemen. The details of this ascent, though it

* The Abóh country may be considered as the western portion of the Eboe country, and is ruled by an independent sovereign.

was effected in 1840, have not before been made public. Mr. Becroft first ascended the Formosa, a fine bold river which divides into two branches, each of which was traced up, one for a distance of 50 miles, and the other 70 miles, when farther progress was rendered impossible by the impenetrable nature of the aquatic vegetation. From the clearness of the water, compared with that of the Niger, before visited by Mr. Becroft, he judged them to be different rivers. Foiled in the attempt to reach the Niger by the Formosa, Mr. Becroft tried what is called the Warru branch, and succeeded in reaching the Niger a little below Ebu. From this point he ascended as high as New Bajibo, in about 9° 40′, and within two hours of Lever: to proceed was impossible, on account of the strength of the current. The vessels, therefore, returned by the Warru. Throughout the six months' sojourn in the Niger, the party was received in the most friendly manner by kings, chiefs, and people. The country above the town Iddah, some 200 miles from the coast, is represented as very beautiful, the soil fertile, and the climate agreeable, the natives peaceable and desirous of commerce. Cotton and indigo are indigenous productions, the latter well prepared and of good quality. Mr. Becroft was directed by his employers to remain in Africa during the year 1841, in order to ascend and trade upon the Old Calabar and Cross rivers; but the prosecution of his purpose was delayed till late in the season, and it was just when on the point of commencing it, that his most timely assistance was required for, and zealously afforded to, H. M. S. Albert, in distress up the Niger; and his success in bringing this vessel to Fernando Po is well known. He nevertheless ascended the Old Calabar, which he says is of no importance beyond the influence of the tides. The Cross river was ascended as far as a town of considerable population, called Ommann, distant about 70 miles in a N. W. by N. course. This town is on an island, and supplies the people of Old Calabar largely with oil and live stock.

I cannot quit the subject of this expedition to the Niger without mentioning the name of Dr. Stanger, surgeon of H. M. S. Albert, who, when the other officers were entirely disabled from sickness, succeeded in navigating the Albert part of the way down the river, with no other knowledge of steam machinery than what he acquired in the urgency of the moment, from the study of Tredgold's work on the steam-engine.

Egypt.—Sir Gardner Wilkinson has availed himself of his recent return to a country which has already been so much illustrated by his geographical and antiquarian labours, to make a minute and accurate survey of the valley of the Natron Lakes, and of a part of the Bahr el

farg, otherwise known as the Bahr belâ má. This wady runs towards El Maghra, or the wady Sumár, on the Siwah road, on one side, and to the back of the mountains at the western end of the lake Mœris, on the other; and a branch also extends to the valley of the Nile, a little below Abooroash, six or seven miles north of the Pyramids of Gizeh. Sir Gardner is decidedly of opinion that this wady has never been the bed of a river, much less what some have called it, the old bed of the Nile. It bears no alluvial deposit, and it is interrupted by numerous projecting ridges. Its sides abound, like many other parts of the desert, with petrified wood.

The wady or valley of the Natron Lakes is 22 miles long, its greatest breadth being 5½ feet from the brow of the hill, the bottom being 2 miles broad. In some of the lakes are springs of fresh water, infiltrated through the sands from the shore of the Nile; the process is very slow, the water of the lakes not rising till three months after that of the river. Not all the lakes produce natron, though muriate of soda or salt is found in all: these substances are found at the bottom, after the surface water has been evaporated; the salt in a layer of about 18 inches thick, and the natron about 27 inches.

Sir Gardner has also sent to the Society a map of this district, the result of observed latitudes by the measurement of a base and triangles.

Abyssinia.—Dr. Beke, in addition to information communicated by him on former occasions, has sent home, since our last anniversary, several reports of his journeys and observations in Abyssinia, which have been kindly made known to us by the gentlemen under whose auspices Dr. Beke has hitherto been travelling. Of these the first is from Fiahr (14th January, 1841), on his route to Ankober. The country round Tajurah, as far as lake Assal, is volcanic, beyond which there are no traces of anything of the sort. The greatest elevation he had observed was 1342 feet, at Arabdera. But the most remarkable fact stated by the traveller is the depression of Lake Assal, which, like the Dead Sea, has its level considerably below that of the ocean. By the boiling of water this depression of the lake, which is only about 20 miles from the sea, was found to be 760 feet.

The next communication from the same traveller was dated Ankober, 3rd March. In this paper Dr. Beke gives the latitude of Angolalla, and the relative situation and distance of several places. He says that Messrs. Combes and Tamisier had been at Shoa, and were consequently the first European visitors since the time of the Portuguese Jesuits. Mons. Dufé, a Frenchman, came next; he died at Jidda; then Isemberg and Krapf, Germans; then Rochet d'Hericourt; and finally himself, being the first Englishman. Mr. Airton had died,

as also Messrs. Fain and Kielmaer. Dr. Beke states Angolalla to be 8400 feet above the sea, and Ankober 8200. The Chakka mountains form the watershed between the Nile and the Hawash. The Beresa is a tributary of the Hawash. The vegetation about Ankober strongly reminded the traveller of England; and he adds, there is every variety of climate in the country.

At Angolalla (29th May) Dr. Beke met with a native of Naréa, who gave him some valuable information relating to the existence there of a great river (the Godjob), which flows, it is said, into the Indian Ocean, either by the river Quilimani, in lat. 3° S., or by the river Tebec at Lamu, or, more likely, by the Rio dos Fogos at Juba, a little south of the equator. Be this as it may, the existence of a large river coming down to the coast in this part of Africa is an object of considerable importance, as forming a line of water-communication with the interior which may ultimately be turned to good account. It is represented as being three miles broad, and navigated by large canoes, each scooped out from a single tree, and capable of containing 50 or 60 persons.

But the most valuable paper, in a geographical point of view, received from Dr. Beke, was dated Ankober, the 12th June. In this communication Dr. Beke details his route from Ankober, the capital of Shoa, to Kok Fara, in the province of Gedem (never before visited by any European), and thence back to Ankober by a more westerly route. In the course of this excursion Dr. Beke first crossed the numerous headwaters of the Hawash, flowing eastward, and, on his return, several streams running westward to the Abaï. He has thus determined that important point, the position of the watershed between these two rivers, which, near Sebcha, in 10° 11′ N., is a swampy moor, with low mountain peaks on either side. Dr. Beke describes the country he traversed as varying in character from the most absolute sterility, to the most luxuriant vegetation. He speaks of large plantations of capsicums and of excellent cotton, of rich corn-fields and fertile meadows, the whole studded with trees, and divided by hedge-rows of jasmine, roses, and honeysuckle. The rivers are subject to be suddenly swelled by rain, so that what has just been forded becomes almost instantly an impetuous and devastating torrent. It is greatly to be regretted, that although Dr. Beke took with him the necessary instruments for making observations, the weather totally precluded his making any use of them. He has, however, mapped his route by bearings and distances, and ascertained the heights of many points by the temperature of boiling water.

The last news from this zealous traveller is of the 24th August, by which we are informed that he was preparing for an expedition to

the westward, and even contemplated a journey across the continent to join the Niger expedition, of the fate of which he was of course ignorant when he wrote. He says he had found iron on his way to Gedem, and had received aluminous slate from Bulga. He supposes that *coal* will be found near it, and hopes that Captain Harris will be able to ascertain the fact. Coal, he adds, has *not* been found near Tajurah, as had been asserted.

In speaking of Abyssinia we cannot omit to mention the mission of Captain Harris. It left Tajurah on the 24th May, and consisted, besides Captain Harris, well known for his adventures in Africa, of Captain Graham, Captain Horton of H. M. 74th Regiment, Lieutenant Barker, I. N., Dr. Kirk, Dr. Scott, and Dr. Impey, geologist and botanist, and a draughtsman, with a European guard of honour. From such an expedition, and from the scientific attainments of those who compose it, much geographical information may be expected; and already we have been favoured, through the kindness of the authorities at the India House, with an extract of a report of Captain Harris, relating to the geographical position of Hurrur, and containing information relative to the various tribes in the vicinity, by Lieutenant Barker.

The 'Bulletin de la Société de Géographie' of Paris, for February last, contains interesting papers on the same country, being the result of the observations of Messrs. Abbadie and Lefebre, together with a small map of the country of Sçoumâl, constructed by M. D'Avezac, ever most zealous in affording his valuable assistance in the cause of geography.

Mons. Rochet d'Hericourt has published the details of his travels in Abyssinia, in the 'Bulletin de la Société de Géographie de Paris.' He landed at Tajurah, and proceeded thence to the kingdom of Shoa, 129 leagues. The whole of Adel is described by M. Rochet as an upheaved volcanic formation, abounding in lava, beds of immense thickness, and thermal springs. The kingdom of Shoa, on the contrary, presents the most beautiful landscapes, decorated by a splendidly varied and vigorous vegetation. On the subject of the river Hawash, M. Rochet says he has been at its sources; that they are situated in the province of Zamettia Galla, and consist of several small pools. The river flows from S. W. to E. N. E., and, after running through the southern part of Shoa in a course of 200 leagues, empties itself into the lake of Aressa, which, at the time of the rains in Abyssinia, may be about 50 leagues in circumference. M. Rochet describes the character of the country through which he passed, its geology, its climate, soil, productions, population, the tribes of which it is composed, and their principal industry. The animals of the country are also mentioned, and the principal towns described; but there are no astronomical determinations of

positions, measurement of heights, or other positive data of this nature. We understand that he has again started for the same country, amply provided with everything requisite for making all the observations which can interest the geographer, and we look forward with confidence to the scientific result of this second journey.

North America.

North America.—The Society has been favoured by Captain Becher, of the Royal Navy, with a very interesting disquisition concerning the three voyages of Martin Frobisher, clearly proving that Frobisher's "Mistaken Strait" is no other than Hudson's Strait, and clearing up other dubious points connected with these early voyages,—a disquisition not only highly interesting in itself, but resulting in the correction of the charts of Frobisher's Straits. This paper will appear in the Society's Journal.

Northern Limit of the American Continent.—The Society is aware that notwithstanding all that has been effected by the zeal and enterprise of those to whom our sea and land expeditions have been intrusted for the purpose of discovering a N. W. passage to China and India, and determining the northern coast-line of N. America, the problem is not yet completely solved. There remains, in order to complete the northern configuration of America, and determine the existence and practicability of the N. W. passage, the spaces between Dease and Simpson's E. limit in lat. 68° 28′ 27″, and long. 93° 7′, and the N. W. boundary of Melville Peninsula on the one side, and the S. W. boundary of Boothia Felix on the other, as well as the W. coast of that land from Cape Nikolai I. to its northern limit. According to Mr. King these surveys may probably by effected by reaching in ships, *vid* Barrow Strait, the N. coast of N. Somerset, and then, according to circumstances, tracing the E. or W. boundary of that land to its most southern limit; or by making in boats, *vid* the interior lakes of America, the Great Fish, or Back's River Estuary, and then tracing its eastern boundary, as the case may be, to its connection with the W. land of Boothia, or the Fury and Hecla Strait. It appears that the desideratum might be accomplished for a comparatively trifling amount, if the boat expedition were preferred, which is desirable on many accounts; and although Her Majesty's Government, to whom we understand the proposition has been made, have not thought it expedient to prosecute the inquiry for the present, we still, as geographers, hope to see it carried into effect, either by the Government, the Hudson's Bay Company, or by private support. Indeed, when we consider how much money has been expended, and how much suffering has been endured, to solve the great problem,

we shall not now cease our efforts, when so little remains to be done to set the question finally at rest.

In the last address which I had the honour to deliver from this chair, in the year 1839, I alluded to the great calamities to which at all times nations are liable to be exposed from a want of precise geographical knowledge; and I mentioned, amongst other causes, the difficulties we were then experiencing in reference to the N. E. boundary of the United States of America, as laid down in the treaty of 1783. We have since that period hailed with satisfaction the appearance of a map of the disputed territory and the adjacent districts by Messrs. Featherstonhaugh and Mudge. This document, which was communicated to the legislature in the year 1840, accompanied with a detail of the observations on which it was compiled, contains a large mass of information on the physical character of the highlands dividing the waters of the St. Lawrence from those of the Atlantic; and as soon as the general physical features of the country which it describes shall have been recognised and identified by American surveyors, their joint labours cannot fail to bring to a satisfactory adjustment a question of paramount importance to the parties interested in its solution.

Massachusetts.—The trigonometrical survey of the state of Massachusetts, commenced in 1831, was brought to a conclusion last year. Mr. Borden, one of the gentlemen to whom, with Mr. Paine, this survey has been confided, has determined the value of a degree of the meridian at the latitude of the State House at Boston; the radius of the equator and the semi-polar axis of the earth giving $\frac{1}{345}$ for the flattening of the terrestrial ellipsoid. Reid, in his Cyclopædia, gives $\frac{1}{394}$; and by combining a degree of the meridian, as measured at Peru, with that in Massachusetts, the result is $\frac{1}{313}$. Massachusetts is a territory containing 8230 square miles: it has been surveyed, in less than ten years, at an expense of only 61,322 dollars.

A detailed description of the Apalachian Mountains has also been drawn up by Mr. W. C. Woodbridge; and it is printed in the 'Bulletin' of the French Geographical Society.

Mr. Catlin's work, entitled 'Letters and Observations on the North American Indians,' is an important contribution, particularly in an ethnographical point of view, to the Monography of this region; and the tour of the Prince of Wied Neuwied in North America will be found to contain some interesting observations.

Mexico.—We are informed that, through the enlightened zeal of General Don Juan Nepomuceno Almonte, a commission has been established for the purpose of drawing up a military, geographical, and statistical account of Mexico: the result of his labours is published successively in

the Government Gazette of the country, several numbers of which have been forwarded to this Society. ·

Texas.—The new republic of Texas has excited considerable interest, and amidst a great deal that has been written on that portion of America, I may particularly mention Mr. Kennedy's work, entitled 'The Rise, Progress, and Prospects of the Republic of Texas,' 2 vols. 8vo.; and 'A History of the Republic of Texas,' by N. D. Maillard, in 8vo.

Central America.

Mr. Stephens, author of a popular work on Central America, in which he has given a variety of illustrations, and full descriptions of the architectural remains of the early inhabitants of that country, has recently set out on a second visit to Guatemala and its vicinity, with a view to extend his geographical and statistical investigations.

M. Mausiou de Caudé has given an account of the Republics of Central America, including the states of Guatemala, San Salvador, Nicaragua, Costa Rico, and Honduras. And a work intitled 'Resumen de la Historia de Venezuela, desde el año 1797, hasta el de 1830,' has been published by R. M. Baralt y Ramon Diaz.

South America.

Venezuela.—The government of Venezuela has set an example which we trust will be followed by the several independent states of South America. It has directed a complete survey of the country to be made, and having confided this important task to Colonel Codazzi, assisted by Messrs. Baralt and Diaz, those gentleman have most zealously performed the duties imposed upon them, and after ten years of incessant labour, brought them to a most successful issue. The result is a large map of the state of Venezuela, engraved at Paris on a scale of three inches to a degree of latitude, besides a copious atlas consisting of 32 historical and physical maps. These maps are accompanied by two volumes of the history of Venezuela, one volume of its geography, and one of its statistics, forming together a complete and systematic body of information regarding a country whose elements of prosperity, it is to be hoped, will ere long be fully developed, to the mutual advantage of the country, of the neighbouring states, and of the commercial world generally. An analysis, by Mr. Bertholet, of the first volume of the history of Venezuela, will be found in the 'Bulletin' of the French Geographical Society.

British Guayana.—Mr. Greenough, in his last anniversary address, informed the Society that Mr. Schomburgk had been sent on a special mission to British Guayana, and that he had safely reached Demerara on the 24th of January of the last year. It was also stated that Her Majesty's

Government, in consequence of a request from the Council of the Society, had permitted him to endeavour to discover the source of the Orinoco. Since that time two memoirs from Mr. Schomburgk, the one on the mouths of the rivers Barima and Waini, and the other on the ascent of the former of those, and other rivers of British Guayana, have been communicated to us by the Secretary of State for the Colonial Department.

With regard to the Waini, Mr. Schomburgk says, that though free from shallows and sandbanks, it is not qualified as a resort for large vessels: it may be navigated by those of small size, there being, at high water, 12 or 14 feet over the bar, and a greater depth in the channel. It is a tidal river, and fresh water procurable only at the distance that can be made by a boat with one tide in its favour. The Barima was entered by a natural channel of communication, which joins this river with the Waini; and here the Barima was 700 feet wide, subject to tidal influence, and its waters of a dark colour. The party having gone on to Cumaka, its correct geographical position was determined, and thence they surveyed the river, first downward to its mouth, and subsequently higher up. At its mouth the Barima has the same disadvantages as the Waini; but when once entered, there is an uninterrupted navigation for vessels of 250 or 300 tons up to the junction of the Aruka; indeed, says Mr. Schomburgk, a finer river for steamers could not be desired: the fish of both the Waini and Barima is abundant and valuable; and if fresh water could be procured for the fishing-stations, the fisheries of these rivers might become a useful branch of internal commerce. Mr. Schomburgk describes the soil and vegetation of this region, and the gigantic trees, which serve the Warrans for their canoes, and from the branches of which the aromatic vanilla hangs in large festoons, perfuming the air with its fragrance.

With regard to the Orinoco, Mr. Schomburgk is of opinion that the river Mocajahi is the only one by which the sources of that great river can be reached.

The part of British Guayana examined by Mr. Schomburgk is an intricate wilderness of anastamosing streams, whose direction hitherto, most erroneously set down in our maps, is now correctly ascertained, while the resources of the country have been well examined.

In Mr. Schomburgk's second report he started from Cumaka on the Aruka, re-entered the Barima, which he ascended to its source, and found it navigable for steamers of considerable size as high up as the first falls. Having re-descended the stream, he quitted it at the settlement of Manari, and going overland in a southerly direction reached the Barama at Cariacu, running here in a direction nearly parallel with the Barima,

and ultimately joining the Waini. The Barama was ascended for four days, and the character of this river itself, and the vegetation on its banks, are described as very similar to those of the Barima. At no great distance from the source of the Barama the party quitted the river, and, following the valley of one of its tributaries, the Aunama, arrived at Haiowa on the Cuyuni, descending which river and its dangerous cataracts Mr. Schomburgk returned to George Town.

The result of this interesting expedition, which occupied three months and a half, is, that, notwithstanding the very unfavourable state of the weather, twenty-one points have been astronomically determined, and a true knowledge has been gained of the course of the rivers Waini, Barima, Amacura, Barama, and Cuyuni, all of which, never having been before visited by any competent traveller, are very erroneously laid down upon our maps.

West Coast.—That there have been great changes in the configuration of the earth's surface is well known; and however slow and gradual the nature of her operations, Nature is still at work upon her task of modifying the forms of our globe: mountains incline their heads, valleys raise their levels, watercourses change their direction, lakes become dry, by desiccation or by upheaving; and while the sea recedes from the land in one place, it encroaches in another. A comparison of what is with what has been, leaves no doubt of these mutations, but they are generally sensible only after a long lapse of years. In some cases, however, the changes are more rapid, and we have an instance of this in a note communicated by General Millar on the rise of the western coast of South America. "There was," he says, "at Valdivia, in 1820, only 2 feet water, where, 60 or 70 years previous, six Dutch line-of-battle ships had anchored. The rivers Bir Bir and Imperial are now scarcely navigable for boats at their mouths, whereas when Urcilla wrote his 'Araucana,' three hundred years ago, large vessels sailed some distance up these streams. At Valparaiso the width of two streets has been gained upon the ocean since 1817."

Australia.

A report from Sir George Gipps, on the progress of discovery and occupation in the colony of New South Wales, has been published; and Captain George Grey, now Governor of South Australia, has given to the world a journal of two expeditions in Western Australia.

Australia (South-East corner).—The exploration of Count Streletsky is well known to the Society; and it will be remembered that in speaking of the several rivers which he crossed, the Count described them as falling directly into the sea. This was, however, merely conjectural, from

the direction of their courses where he crossed them, and from the general direction of the slopes of the country. We have, however, since received the copy of a report from Mr. John Orr to Governor La Trobe, by which it appears that the course of the La Trobe river is *not* south-west, as laid down by Count Streletsky, but is due east, and in its progress it receives the rivers Maconochie, Barney, and Dunlop, which rivers were at first supposed to empty themselves directly into the sea. The La Trobe, increased by these tributaries, falls into a large lake, described as being 20 miles long from east to west, and 6 miles broad, and which also receives the Perry. This lake was named Wellington.

Australia (South).—The importance of the Murray river to the colonies in the south-east part of Australia depended chiefly, if not solely, on the practicability of passing into it from the sea. We are happy to be able to state that the Waterwitch, Government cutter, of 22 tons, and drawing 6 feet water, has been warped into the sea mouth of this river.

Australia (the Interior.)—Our curiosity respecting the interior of this great island still remains unsatisfied, but our knowledge of the *seabord* is constantly increasing. It will be remembered that after the enterprising Mr. Eyre had found his intended progress northward from the head of Spencer's Gulf intercepted by that extraordinary geographical feature of the country, the great Horse-shoe Lake (Torrens), he directed his steps towards Streaky Bay, in the hope of finding to the west of the lake the means of resuming his original direction.

Mr. Eyre left Fowler's Bay on the 25th February, accompanied by an overseer and three native boys, and provided with horses and provisions for nine weeks, and reached King George's Sound on the 7th July, having traversed over upwards of 1040 miles; for the last half of his journey, the whole of which was attended by the most distressing circumstances, he was only accompanied by a native of King George's Sound, of the name of Wylie. In passing from behind Lucky Bay to the Lagoons west of Esperance Bay, a considerable extent of grassy land was passed, with many patches of rich soil in the flats and valleys, and abundance of water. There was, however, no timber but the tea-tree. From the Salt Lagoon the country crossed over was very barren. About 16 miles north-east from Cape Reche, the travellers fell in with a considerable salt-water river from the W.N.W., which appeared to join the sea at a gap left by Flinders in the coast-line. On the banks of this river were some Casuarina, tea-trees, Eucalypti, and a little grass. Inland from where the river was crossed, the country seemed to improve, and good runs for sheep and cattle might perhaps be found in that direction. Farther westward the mahogany, red gum, and other trees commence, and continue to King George's Sound, the

whole way to which settlement they form a tolerably dense forest. Very few natives were met with by Mr. Eyre on his route, and those were for the most part timid or well disposed.

Australia (North Coast).—In a communication made to this Society by Mr. Windsor Earle, mention was made of fresh water being taken up from the side, by the prahhs in the Gulf of Carpentaria at a considerable distance from the shore. This would, naturally, induce the supposition that a large body of fresh water must flow into the gulf, and in effect we have recently received an account from Acting Commander Stokes of two rivers discovered by him falling into the Gulf of Carpentaria, to which he had given the name of Albert and Flinders rivers. They are said to be small, but there is evidence of their being greatly swollen at certain times of the year, as rushes, grass, &c. were found adhering to the branches of the trees twenty feet above the present level of the water.

In connexion with Australia, I may mention that Depuch Island (one of the Forestier group), lying on the west coast of that continent, has been lately visited by Captain Wickham, who describes it as a large pile of greenstone rocks rising 514 feet above the level of the sea; while the opposite coast, only one mile distant, is quite flat. It has no other vegetation than a few stunted gum-trees, and a coarse wiry grass. The islands of Forestier's group are visited by the natives of the main for fish and turtle. There is a very good and well sheltered anchorage off the sandy beach on the N.E. side of Depuch Island, and a trifling supply of firewood may be obtained; but water is not to be depended upon at all seasons. The most curious objects on the island are the native drawings which are cut or scratched on the rocks. Of these Captain Wickham has made and sent home several sketches.

New Zealand.—The northern island of New Zealand has lately been explored by the late Captain W. C. Symonds, whose untimely fate I have already alluded to as a grievous loss to science. According to a letter from Auckland, dated the 4th October of last year, he had succeeded in making his way to the interior of the island; and was preparing a chart, with a detail of his observations, and a vocabulary of 3000 words, which, when completed, he would have forwarded to the Society. He had traced the Waipa and Waicato rivers to their sources, as also the Thames, and ascertained the sources of the Wanganai and Manewatu rivers, which flow into Cook's Strait. He had visited the twenty Lakes, occupying a great portion of the central and N.E. parts of the island, and had inspected the hot springs which run in a line from Mount Edgecombe in the Bay of Plenty, to Mount Egmont on the western coast.

'The river Owerrie, in the middle island, was explored in 1840 by a party from the Pelorus, who gave to it the name of that vessel: its waters are deep enough to serve as a port of refuge in Cook's Strait, though its entrance is not easily perceived.'

Chatham Islands.—These islands, which lie to the S.E. of New Zealand, have been most minutely examined by Dr. Dieffenbach, in whose opinion nothing more is required than surface drainage, which may be very easily effected, in order to obtain abundant crops of every European grain and vegetable. The surface of the larger island is estimated at 305,280 acres, of which 57,600 at least are occupied by lakes. Of the remaining 274,680 acres, 100,000 is good cultivable land, the rest being for the greater part fit for pasturage. Building materials and lime are plentiful, as also water and fuel; water-fowl and fish are in great abundance. There are some very good harbours on the western side of the island; and the climate is most genial.

According to the latest accounts, it seems that the sea has burst into the large freshwater lake near the western coast of the larger island, and has converted it, for the time at least, into a great bar-harbour.

Indian Archipelago.—With regard to the islands of the Indian Archipelago, we learn from Captain Stanley, of H.M.S. Britomart, that at the Ki Islands a fine harbour has been surveyed, where all sorts of supplies and boats may be procured in abundance, and where timber of good quality abounds, and close to the beach. From the Ki Islands Captain Stanley visited Banda and Amboyna: he then made the island of Welter; coasted along the northern side of the Serwatty group, and anchored at Kesser, and then at Littu. He informs us that the reefs of the Luan group are much exaggerated, and badly laid down in our maps. Baber was next visited: then Cerra, on the west coast of Timor Laut, at the southern extremity of which a good harbour is said to exist. It is only one day's run from Port Essington, whither the Britomart returned. The settlement of Port Essington is represented as being very healthy; but the climate is too hot for European labour. The Britomart next proceeded, first to Coepang, and then to Ampannan, in the island of Lombock: this latter is described by Captain Stanley as a place of considerable trade, and where rice and all sorts of stock are abundant and cheap.

Accounts have been received from Mr. Earle, dated the 13th of July, from the Coburg Peninsula, giving a very satisfactory account of the state of things at Port Essington, of the commerce with the natives, with the Malays, the Macassarees, &c., as also some notices respecting Sandal-wood Island.'

Borneo.—Mr. J. Brook, already known to this Society for his obser-

vations on part of the coast of Asia Minor, has added largely to our stock of knowledge of the physical geography and the resources of the W. and N.W. coast of Borneo. Between Tanjong Datu, in lat. 2° 7′ N. and 109° 43′ E., and the Marah-Basar, or the principal entrance of the Borneo River, about the 5th degree of N. lat., are many considerable rivers navigable for European vessels, several of them connected with each other, and diverging into numerous streams, which descend from the range of mountains separating the N.W. coast from the Pontianah River. These mountains are about 3000 feet high: the ground below is undulating, the aspect of the country generally low and woody at the entrance of the rivers, and in the interior some fine level plains, the climate healthy, and comparatively cool. It produces fine timber, and many parts are well calculated for the growth of nutmegs, coffee, pepper, or any of the more valuable productions of the tropics: diamonds, gold, tin, iron, and antimony also abound; and there are promising appearances of lead and copper. The Dyaks, or inhabitants of the hilly districts, are described as an interesting race, presenting many facilities for the amelioration of their condition, but they are much oppressed by a more warlike and active people called the Pangerans. A few Malays occupy the coast, and much of the hard labour is performed by some Chinese. Mr. Brook thinks that this district offers many advantages for a settlement, that the natives might easily be trained to habits of order, and that they would readily submit to a beneficent and protecting government.

Miscellaneous.

South Pole.—With the brilliant results of Capt. J. C. Ross's expedition to the South Pole the members of this Society and the British public generally have been already made acquainted. Nevertheless, it would be unpardonable in us, in recapitulating what has been done for geography since our last anniversary meeting, not to recur to the most interesting discovery of modern times, namely, that of an Antarctic land, part of a large South-polar continent, or of a group of Antarctic islands. This land, which has received from Captain Ross the name of Victoria Land, was traced by that officer through nine degress of longitude, that is from lat. 71° 56′ S. to within less than 12 degrees of the South Pole, in the long. of 173° 30′ E., being about 4 degrees farther south than was attained by Weddell in 1823, and 11° 34′ farther than Admiral D'Urville's farthest in his late exploration. It is of igneous formation, and, from the great height of its mountains, must be of large dimensions. On its summit, Nature has established one of those great vents by which the escape of the elastic gases generated in the bowels of

the earth is effected. This great active volcano, in S. lat. 77° 32′, and E. long. 167°, rises to the height of 12,400 feet, and has been named Mount Erebus. I need not, however, dwell upon the details of the expedition of the Erebus and Terror, under the command of Captain Ross and Commander Crozier: they are, as I have observed, already known. And it is for the great additions made by Captain Ross, during this expedition, to our knowledge of the physical confirmation of the globe, that the Council of the Society have awarded to that distinguished officer one of the medals placed at their disposal this year.

Coral Reefs and Islands.—The geographer is entitled to claim his portion of interest in a work which has very recently made its appearance from the pen of Mr. Charles Darwin, Naturalist to the expedition of the Beagle under Captain Robert Fitzroy: this work, which is a monograph of considerable interest to physical geography, is entitled 'On the Structure and Distribution of Coral Reefs.' These extraordinary phænomena in the construction of the world's surface, as abundant in the tropical, as they are rare in the extra-tropical regions, are divided by Mr. Darwin into "Atoles, or Lagoon Islands," "Barrier or Encircling Reefs," and "Fringing or Shore Reefs." They sometimes penetrate to very great depths, and present to the sounding-line the appearances of precipitous cliffs; consequently, from the limited depths to which it is supposed that reef-building polypifers can flourish, and from other circumstances, it may be presumed that the foundation on which the coral has primarily attached has subsided, and that during this downward movement the reefs have grown upwards. This conclusion, Mr. Darwin thinks, satisfactorily explains the outline and general form of the reefs, as well as the peculiarities of their structure. The distribution, likewise, of the different kinds of coral reefs, and their position with relation to the areas of recent elevation and to the points subject to volcanic eruptions, agree with this theory of their origin. Besides a variety of these reef-islands, which are particularised in two annexed plates, there is also a map embracing the whole extent of the Eastern Seas between the western coast of S. America and the eastern coast of Africa, in which all the Lagoon Islands, barrier reefs, fringing reefs, and active volcanoes within these limits are carefully noted, and marked with distinguishing colours.

Terrestrial Magnetism.—One principal ingredient towards arriving at the desired precision in fixing positions is found in the multiplying and comparison of contemporary magnetic observations. This has been carried on within the few last years with great activity and correspond-

ing success on a great variety of points in different parts of the globe. In the British dominions magnetic observations have already been established at the public expense at Greenwich, Dublin, Toronto, St. Helena, Cape of Good Hope, Van Diemen's Land, Singapore, Scinde, Madras; besides two at Makerstown and Trovandrum, at the expense of some private individuals. There are two in the United States, namely at Philadelphia and the Harwood University. Besides these are one at Brussels, Munich, Göttingen, Berlin and Breslau, Prague and Milan, Cadiz, Christiania and Copenhagen, and several in Russia, as at St. Petersburg, Kazan, Catherinenburg, Barnaoul in the Government of Tobolsk, and at Nertchinsk: others are being established, or are more or less in action, at Nicolaeff, at Moscow, Sitka, N.W. coast of America, Tiflis, Helsingfors, at Pekin even, at Turin, Geneva, and Cairo. This important subject having attracted the attention of the first mathematicians and natural philosophers of the age, and at their suggestion having obtained the liberal support of almost all the governments of Europe, there can be no doubt that if the systematic arrangements for reciprocal communications and comparisons be continued for a few years longer, a very great accession to our knowledge of the more hidden forces acting upon our globe will be obtained. On this subject I would particularly beg leave to notice the tour of inspection lately made by Mr. A. T. Kupffer, Director-General of all the observations of the Russian Empire: this journey of 15,000 versts, which occupied the space of six months, was for the special purpose of organizing the magnetic observations of the empire, according to a new plan adopted by the Congress for magnetic purposes lately assembled at Göttingen. Mr. Kupffer is at present occupied in drawing up a report of the results of his expedition, and we have every reason to hope that his tour of inspection will have been productive of further measures on the part of the Russian government for the extension and improvement of this very interesting branch of physical science. In this report will also be contained Mr. Kupffer's observations on the temperature of the soil in many parts of the district which he visited.

Geography of Plants.—We are happy to state, on the authority of our learned correspondent Dr. Martius, that the Prince Royal of Bavaria has established a premium for the best memoir on the Geography of Plants and Vegetable Statistics of Bavaria, and has also set on foot a Geological Survey of the country.

Sugar-Cane.—The indefatigable Carl Ritter, of Berlin, has recently enriched our library with a copy of his very learned dissertation 'On the Geographical Extension of the Sugar-cane (Saccharum officinarum) in the Old World, prior to its Transplantation into the New World.' The Me-

moir is accompanied with a map, showing the various localities in which the plant has been cultivated with more or less success, from the eastern shores of China to the Canary Islands; and the author furnishes us with many new and interesting details respecting the occasion and periods of history when it was successively transferred from China and Cochin China, the basin of the Ganges, and the southern points of the peninsula of India, to the borders of the Persian Gulf and Red Sea, the basin of the Nile, Palestine, Sicily, Spain, and parts of the east and west coasts of Africa.

Ancient Geography.—Gustaf Kramer, Professor in the Royal French College or Gymnasium at Berlin, has sent to us a copy of his Critical Commentary on the Greek MSS. of Strabo, the father, as far as we know, of descriptive geography. Of these Mr. Kramer enumerates seven in the Royal Library at Paris—two of which are on vellum, four on paper, and one is described as 'bombycinus,' or on cotton. That on vellum, marked 1397, is the most valuable, notwithstanding its imperfect state: its age is unknown, though it is first mentioned about the middle of the 16th century, when it belonged to the Strozzi. Maria de' Medici removed it to Florence, whence it was brought, along with another MS. of the same author, to Paris. One on cotton, and three on paper, are in the Vatican: four others, on paper, in the Laurentian Library, at Florence; three on paper, one on vellum, and one on cotton paper, at Venice; and two, on paper, in the Ambrosian library at Milan. Scarcely any of these contain the whole 17 books in a perfect state, and the most ancient of them, that on cotton-paper, at Venice, may be of the beginning of the 14th century. All these had been inspected by the author. The others he refers to are, one at Eton, one at the Escurial, one at Moscow, and a fourth at Madrid. The Professor enters into full details to show the comparative value of these MSS., from the various states of preservation, the different readings they contain, and the lacunæ or interpolations in each.

Mr. Remgarum is employed upon the sequel of his History of the Geographical Maps of the Ancients.

Baron Walkenaer's '*Relations des Voyages en Afriques depuis 1400 jusqu'à nos jours,*' is announced as in progress. It will be in 21 volumes, and will form a complete body of authentic information on the subject.

The Royal Society of Northern Antiquaries have published their *third* volume of 'Historical Narratives of Icelandic Voyages at Home and Abroad.'

Major North Ludlow Beamish, of Cork, has published the 'Discovery of America by the Northmen of the 10th Century, with Notes of the

carly Settlement of the Irish in the Western Hemisphere, founded upon Professor Rafn's "Antiquitates Americanæ."

Davis's Lecture on the Discovery of America by the Northmen, 500 Years before Columbus, has reached a fifth edition.

The second volume of the 'Itinerary of Rabbi Benjamin of Tudela' has appeared, and Mr. Asher, the translator and editor, has liberally placed 10 copies of it at the disposition of the Council of the Society, to be distributed to such travellers as are best qualified to appreciate and to use it.

Ethnology.—Dr. Pritchard has brought out the 3rd volume of his highly interesting and very important work on the Physical History of Mankind—a subject which is intimately connected with geography; and the Ethnological Society of Paris have published the first volume of their Mémoires, in which will be found a most elaborate paper, by M. Gustave D'Eichthal, on the 'History and Origin of the Foulahs or Fellahs.'

Dr. Gustaf Kombst has published in Edinburgh an Ethnographic Map of Europe, in which the various races and their admixture are pointed out by colours.

A learned pamphlet on the Himyaritic writing and language has lately been published by Dr. Gesenius, of Münich.

At Milan a small ethnographical work has been put forth last year, by a learned Tuscan lady, Da. Amalia Nizzoli, entitled 'Memoria sull' Egitto.'

Geographical Instruction.—The study of Geography is advancing in Frankfort. At the Geographical Society of that town, a series of well-attended lectures have been given by Dr. Kriegk on the Geography of Africa and the Barbary States, China, Egypt, Arabia, &c. The number of members of that Society is also increasing, as well as their collection of Books and Maps. They are in hopes of obtaining a large room in the new Museum of Natural History, towards the expenses of which Dr. Rüppel with his usual liberality has contributed 8000 florins. A Magnetic and Astronomical Observatory is also about to be erected in this city.

In Paris Mr. J. D. Guigniaut, Professor of Geography, and the successor of M. Barbié du Bocage, continues his lectures.

Mr. M'Culloch's Geographical and Topographical Dictionaries are nearly completed.

The Topographical, Statistical, and Historical Gazetteer of Scotland, by Mr. Fullerton, of Glasgow, and the Parliamentary Gazetteer, are in progress.

At Naples, M. Raffaele Mastriani continues his corrected and much increased edition of his Geographical Dictionary of the Kingdom of the Two Sicilies.

The Geographical Dictionary of Tuscany, by D. Emanuel Rapetti, is still going on; Parts 39—31 of Vol. IV. have now been issued.

At Turin, Professor Casalis's Geographical Dictionary of the Sardinian States has reached the 34th part; and, at the same Place, an abridged Geographical Dictionary of the whole World, by J. B. Coster, in two thick octavo volumes, is in the course of publication.

Mr. Hughes is also preparing for publication an Atlas of Constructive Geography; the chief object of the author is to accustom the learners to the forms of continents, and the latitudes and longitudes of all the principal capes, bays, mouths of rivers, ports, &c.

An Atlas Elémentaire Géographique et Historique, by Professor Paul Chaix, of Geneva, one of our corresponding members, has been constructed to accompany his Elementary Geography, which is adopted in the colleges of Switzerland, and in some of those of France.

Mapping.—The science of mapping is much indebted to M. Lacarde, a young mathematician of France, for a very simple and easy method of finding the radius of any given arc, and for describing an arc whose radius is known.

M. Chartier, of the Map Department of the French War-Office, has published a Geodesical Manual, containing the most improved methods of surveying and mapping a country.

Anaglyptography.—The Anaglyptographic mode of engraving maps has not received much extension, and this is easily accounted for. Before a plate can be engraved by this mechanical process, it is essential to have a perfect model of the country. This is both difficult and expensive, and is probably the reason that the process has not yet come into more general use; but it is capable of great improvements, and it is already a beautiful instance of the combination of different processes in the production of works of art.

Electrotyping.—The art of multiplying maps by means of electrotype plates is making considerable progress in Germany. In Saxony it has been attended with great success, and its practical application is likely to lead to the extension of geographical, or at least topographical knowledge: the Minister of War at Dresden has already in consequence of it lowered the charge of the National Atlas to one-third of its original price. This is the more gratifying, as it is quite impossible, when done with care, for the most experienced eye to perceive the slightest difference between an impression from the original engraved plate and one from the electrotype plate.

Lithography.—Great progress has been made in the typography of maps in Vienna. Lithographic maps and charts are there brought to great perfection; as also in Bavaria, and generally throughout the Continent.

Model Mapping.—The plan of representing countries in relief is gaining ground, particularly in Germany. Mr. K. W. Kummer, of Berlin, has published globes in relief, both terrestrial and celestial; also topographical, chorographical, and geographical maps, planetariums, &c. M. Bauerkeller also continues at Paris to produce relief maps and plans of cities: of the latter class I may mention a new edition of the Plan of London: this is in hand, and will show, with the last census, all the present improvements of our metropolis.

In Switzerland a large and most beautiful relief map of the country has been in progress for these six years: it is the work of Mr. Séné, of Geneva; and on a very large scale, will contain the Alps between M. Velan (Eastward), Cramont (S.-Eastward), Col de Bonhomme (Southward), Buet (N.W.), and Martigny (N.). It will be finished next year, when we are promised a detailed account of it. In our own country Mr. Bielfield has produced a papier-maché relief of the Pyrenees, and some others; and more recently Mr. Bailey Denton has applied himself with success to the construction of model maps.

We learn also from Frankfort, that Mr. Ravenstein is about to publish a relief map of Germany, including Austria and Prussia (particularly for the use of schools: it will be 12 feet by 10). Scale 1 : 300,000. A copy of it is to be exhibited in every considerable town in Germany.

I have dwelt with some detail on these mechanical applications of improvements in art and science to the extension of geographical knowledge, from an anxiety to lose no opportunity of making more generally known whatever may contribute to render our pursuits popular, and to increase their utility; but in doing so, Gentlemen, I fear that I have detained you too long: I have but a single word to add. The study of geography is the most natural, as it is the most useful, of all human pursuits. The moment we step beyond our own threshold, we are entering on a world comparatively unknown to us, and this is the case as we go on. New scenes are continually unfolding themselves before us, historical, poetical, practical; but we see nothing, we understand nothing, we invent nothing, we seek for, and we find nothing, unless we comprehend in our mind's eye a *locus in quo*, a *locus ad quem*, a *locus à quo*. Where we are, whither we are going, whence we come, all enter into our daily actions, and are all geographical questions. The first books we read, Homer for instance, Livy, the Bible, are all based on geographical and topographical identifications: hence we begin, and to these we must return. I have observed before, that, though geography may be devoid of the charms of other systematic sciences, though it does not lend itself to brilliant theories, though it scarcely admits of the most innocent speculations, though it treats merely of dry matters

of fact, yet has geography other, and perhaps superior, claims upon your regard. It looks alone to truth as its object; and not to a fleeting, abstract, ideal truth, but one which is at once intelligible, solid, and imperishable, the absolute and relative positions of definite and fixed places: these once agreed upon, no further doubt or discussion are required: the object is gained, you have got what you were in search of, and you instantly set out in pursuit of other game, equally tangible, and as accessible, as that from which you start. Of the extent of our science there cannot be two opinions. It embraces the whole globe on and in which we live and have our being; all the interests, all the occupations of men, are, more or less, dependent upon it. It is the main-spring of all the operations of war, and of all the negociations of a state of peace; and in proportion as any one nation is the foremost to extend her acquaintance with the physical conformation of the earth, and the water which surrounds it, will ever be the opportunities she will possess, and the responsibility she will incur, for extending her commerce, for enlarging her powers of civilizing the yet benighted portions of the globe, and for bearing her part in forwarding and directing the destinies of mankind.



PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY.

I.—*The Voyages of Martin Frobisher.** By A. B. Becher, Commander, R.N., of the Hydrographical Office, Admiralty.

It is remarkable that, while numerous voyages of discovery have been made with the object of extending our knowledge of the northern polar regions during the last three centuries, the discoveries of one of our earliest arctic navigators have been left unheeded. The attempts of Martin Frobisher and his daring companions in the reign of Elizabeth, to find a N.W. passage, were directed to a portion of the northern regions which has been left on the one hand by subsequent discoverers proceeding north-

* It may not be altogether useless or uninteresting to the geographer to mention in a note the principal materials from which a knowledge of the adventures and discoveries of Frobisher may be obtained. It is not creditable to our country that so little has been done to preserve and render available the records of the navigation of his age. Captain Becher's paper shows that they contain valuable material even for positive geography; and their importance for the purposes of comparative geography is still greater. The accounts we possess of Frobisher's expedition to the N.W. are partly printed and partly MS.

I. Printed.—1. "A true Discourse of the late Voyages of Discoverie, for the finding of a Passage to Cathaya by the N.W., under the conduct of Martin Frobisher, General: divided into three bookes. In the first whereof is showed his first voyage, wherein also by the way is sette out a geographical description of the worlde, and what partes thereof have been discovered by Englishmen. Also, there are annexed certayne reasons to prove all partes of the world habitable, and a general mappe adjoyned. In the second is set out his second voyage, with the adventures and accidents thereof. In the thirde is declared the strange fortunes which hapned in the third voyage, with a severall description of the country and the people there inhabiting. With a particular card thereunto adjoined of Meta Incognita, so farre forth as the secretes of the voyage may permitte. At London; Imprinted by Henry Bynneyman, servant to the Right Honourable Sir Christopher Hatton. Viz-Chamberlaine. Anno Domini 1578." A copy of this work is in the King's Library, in the British Museum:—C. 13. a. 9. Some

remarks on the "card" will be found at the close of Captain Becher's paper.—2. Hackluyt's folio volume, published in 1589, entitled "The Principal Navigations, Voyages, and Discoveries made by the English Nation." This collection contains, in addition to a reprint of George Best's "True Discourse," a journal of the first voyage by Christopher Hall, an account of the second by Dionysius Settle, and an account of the

ward up Davis Strait into Baffin's Bay, and on the other by those proceeding westward through Hudson Strait. Hence Frobisher's ground has remained untouched since his time, and it is with a view to extricate from oblivion places which he discovered, and to assign to them, as nearly as can be done, their relative positions on the chart, that the following paper has been undertaken. The materials it is true are scanty, and there is a vagueness in many of them which is unsatisfactory; still the relative positions of some points and the names assigned them are sufficiently determined to prove that the merit, if any, of prior discovery, indisputably belongs to Martin Frobisher.

The three voyages of Martin Frobisher were performed in the years 1576, 1577, and 1578; the first apparently with the laudable object of geographical discovery, the other two with that of obtaining treasure.

First Voyage.—The ships employed were the "Michael" of 30 tons, the "Gabriel" bark of 35 tons, and a pinnace (or pinnesse, as formerly written) of about 10 tons; the "Michael" being commanded by the Captain-General Martin Frobisher in person. They sailed from Ratcliffe, in the River Thames, on the 7th of June, and we may picture to ourselves the excitement occasioned by her Majesty Queen Elizabeth honouring the ad-

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third by Thomas Ellis.—3. Hackluyt's General Collection of Voyages and Travels, published in three volumes, folio, 1598—1600. In this collection many passages are omitted in the journal of Christopher Hall; and it is this mutilated copy that has been reprinted by Pinkerton, and in the edition of Hackluyt, published in 1810. The French, German, and Latin accounts of Frobisher's voyages, which have appeared from time to time, are either reprints or abstracts of Best's discourse, or the journals printed by Hackluyt.

II. Manuscript.—1. "The Doings of Michael Lok, for the Voyage of Cathay." This MS. is bound up with some other papers in a volume of the Cottonian MSS. in the British Museum (Otho E. VIII.—23. c.), which has been materially injured by fire. It consists of two fragments: the first, a draft account of the first voyage by Lok, who was secretary to the adventurers; the second, a part of a vindication of Lok's conduct as secretary, drawn up by himself. The papers alluded to in Captain Becher's paper, as found in the State Paper Office, and published in the "Nautical Magazine," are extracts from accounts relating to Frobisher's voyages, found in the archives of the Court of Exchequer. This second of Lok's papers has the appearance of an explanatory statement, intended to accompany them.—2. Some papers bound up in a volume of the Harleian MSS. (61. f.), viz.:—a. "The Account of the Third Voyage to Meta Incognita, made by Mr. Christopher Hall, master of the ship Ayde, and now pilot in the ship Thomas Allyn." This is a regular log of the voyage, kept with great neatness and apparent accuracy by the same Christopher Hall, whose journal of the first voyage has been turned to such good account by Captain Becher. It belonged at one time to the notorious Dr. Dee.—b. A Journal of the Third Voyage, endorsed "Edward Sellman wrote this book, and he delivered it to Michael Lok the 2nd of October, 1578, in London."—3. c. A fragment of a Narrative of the Third Voyage, by an anonymous person "on board the Judith, over whom Edward Fenton is master, Charles Jackman pilot."—To these may be added a chart of the northern hemisphere by Dr. Dee, who took an active part in instructing and exercising the mariners engaged in these voyages in the art of making observations, and who appears to have obtained possession of many of their journals.' It forms part of the Cottonian collection of MSS. (Augustus I. vol. i.) in the British Museum.—[Ed.]

venturesome navigators with her parting farewell. The journal of the voyage, preserved by Hackluyt (p. 615 of the edition of 1589), says—"At 12 of the clocke we wayed at Deptford and bare downe by the Courte, where we shotte off our ordinance, and made the best shewe wee could: her Majestie beholding the same commended it, and bade us farewell with shaking her hand at us out of the windowe."

By the 13th the expedition was clear of the river, passing down the Swin, or "Sweane," as Hackluyt calls it, and after touching at Harwich and Yarmouth they finally left Tronion Sound,* off Orkney, on the 26th of June, standing to the W., with a wind at S.S.E. The journal is very minute † thus far; a quality by which unhappily it is not characterised in other parts which are of more importance. Before we proceed, it will be useful, as guiding us in our conclusions hereafter, to look at the observations for latitude that are given in this early portion of it, and compare them with the known latitude of the places where they were obtained.

The first is "when over against Gravesend, by the castle or blockhouse, we observed the latitude, which was 51° 33′" on the 12th of June.

The second is at Harwich House; on the 17th the journal says, "We did observe the latitude of the place 51° 54′."

Another latitude is recorded on the 20th, but the third in question is on the 26th. "When sailing from Fair Yle to Swinborne Head," the journal says, "I did observe the latitude, being the island of Fowlay, W.N.W. from me 6 leagues, and Swinborne Head E.S.E. from me * * my latitude was 59° 46′."

The fourth latitude which I shall quote was with the island of Fowlay bearing E.N.E. 2 leagues distant, and is 59° 59′ "truely observed," which we may suppose to have been a satisfactory observation.

Taking these in their order, we find the first off Tilbury Fort to have been observed 51° 33′, correctly 51° 27′, error 6′ too Northerly.

2nd. ..	51 54 ..	51 57 ..	3 too Southerly.
3rd. ..	59 46 ..	59 55 ..	9 too Southerly.
4th. ..	59 59 ..	60 3 ..	4 too Southerly.

On the whole the foregoing results are not amiss, considering the rude instruments used at sea above 250 years ago, and, as it now becomes a matter of much interest to know what these instruments were, it is gratifying to find that an account of them has been preserved among the records of the State Paper Office, some

* Perhaps Stromness, or St. Ninian Sound, from the proximity of the latter to Swinborne, now called Sumburgh Head, and which he particularises as "the southernmost head of Shetland."

† There are various soundings about Fair Isle and the S. end of the Orkneys, as well as off Foulay Isle, mentioned in the journal (Hackluyt, p. 617), and which do not appear in the charts.

of which were printed and published in 1833. Among these papers is a complete list of Frobisher's instruments, with their prices.* It is most probable that the observations were made with the astrolabe, or the sea-ring (*annulus astronomicus*) there mentioned. From the examples given above we may infer that the latitudes given by this early navigator do not differ 10 miles from the truth; and perhaps in the smooth waters of the frozen straits, in which we shall hereafter find him, they may not be so far from it. We will now follow him in his voyage across the ocean.

On the 27th of June the expedition took a departure from the island of Fowlay, "2 leagues E.N.E.;" and the journal commences with an exact statement of the course and distance made good in every watch. This precision of reckoning is continued throughout, but only in the first voyage; and even there it has been omitted when the latitude is observed or when it is given by account, particularly in several places about the entrance of the strait, where this information would have been essential. The variation being given in the commencement as well as the middle of the voyage, it seemed worth while to make an attempt at laying down the track, which was accordingly done, due allowance being made as statements of wind, &c., permitted, and the result was satisfactory.

On the 11th of July the journal says, "At the S.E. sunne we had sight of the land of Friseland, bearing from us W.N.W. 16 leagues, and rising like pinnacles of steeples, and all covered with snow. I found myself in 61° of latitude." Now the track by the reckoning places the ships about 180 miles to the S.E. of this position, being so much short of the actual distance run, from which we may conclude that Frobisher's distances have not been over estimated. This will justify a full allowance to the estimated distances which we afterwards meet with. The land now made was of course the coast of Greenland, the southern part of which we find bearing the name of Friseland in the old charts. The vessels made for the land, and an attempt was made to send a boat on shore, which proved ineffectual. We afterwards find the ships steering S.W. along the coast before a N.E. gale, which freshened so considerably as to spring the foreyard and carry away the mizenmast of one of the ships. The journal of the 14th says, "The vehemence of the winde brake our foreyarde, and bore over boorde our missen maste, so we put our spreet-saile yard with the spreet-saile coarse to our foremast and spooned afore the sea S.W. 15 leagues." On the 16th another calamity befel the ship, for we find it stated, "At the ende of this watch the

* See Nautical Magazine, vol. ii. p. 470.

head of our maine mast, main topmast, with the topsaile, brake, and fel into the sea altogether."

The track of the ships now becomes of considerable importance, because in the old charts, in which there is much confusion, we find a strait *made* through the southern part of Greenland on purpose, as it were, for Frobisher to pass through. Yet it is evident, from the courses and distances given, that he ran to the southward round Cape Farewell, and saw nothing of land again till the morning of the 22nd, on which day the journal says (p. 619), "We had sight of a great drift of yce, seeing a firme land, and we cast westward to be cleare of it." It seems probable, by the reckoning round the Cape from the 11th, which agrees here better than could have been expected, that the drift of ice was on the coast to the E. of the land forming Cape Desolation; for by the journal it appears the ship stood to the southward to clear it. No further mention is made in Hackluyt of the land of Friseland, although the ships afterwards stood to the N.N.W. along the coast, and did not commence the voyage across Davis Straits until the 24th.

It being very desirable to ascertain where the next land was made as an additional clue to the position of Frobisher's Strait, the distances run have been laid down, but they fall very short of the actual width of Davis Strait. The journal fortunately gives the latitude on the 26th of 62° 2′, when it might be supposed Frobisher was about the middle of the passage across, but land, supposed to be Labrador, is suddenly made on the morning of the 28th on fog clearing away. The deficiency in the distance amounts to about 180 miles from where the ships were on the 26th by an assumed reckoning, to about the meridian of the eastern point of Resolution Island, not far from which it may be supposed the land will be found. We now enter the most important, and yet the most unsatisfactory, part of this discussion. We have unfortunately no data for determining the precise situation of the land made on the 28th. The journal tells us that on the clearing away of the fog on the 28th the ships "had sight of land," supposed to be Labrador, and that no soundings could be got at 100 fathoms—"the land could not be approached for the ice." Next day the land was approached, a boat was sent away, but could not land, and could not get bottom at 100 fathoms within a cable's length of the shore. The journal next says, "Then we sailed E.N.E. along the shoare, for so the land lieth, and the current is there great, setting N.E. and S.W.; and if we could have gotten anker ground we would have seen with what force it had runne, but I judge a ship may drive a league and a half in one houre, with that tide."* This last observation is important, and is extracted for the purpose of reference hereafter.

* Hackluyt, p. 620.

On the 31st a headland is seen bearing N. by E., and a course N.E. by N. is steered to approach it, which was effected no nearer than 5 leagues, by reason of the ice. On the 1st of August soundings were got at different depths, but the only useful remark is, that "the tide did set to the shore." From this time to the 10th the vessels were prevented by easterly gales and calms from prosecuting their voyage, and an estimated track places them nearly where they were on the 31st July. But on this day also Frobisher went in his boat to an island one league from the main, where he says, "the flood setteth S.W. along the shore." The next day (10th) the journal says, "We found our latitude to be 63° 8′ and this day we entered the strait." The main alluded to, it may be supposed, is the land on the northern side of the strait. The information contained in the journal regarding places within the strait is so very scanty that it will be best to reserve all notice of it till that obtained from the subsequent voyages falls under consideration. It may, however, be mentioned here that the places named are Gabriel's Island, Prior's Sound (after Frobisher's vessel), Thomas Williams's Island, Burcher's Island, near to which is Five Men's Sound (called so from the circumstance of a boat with five men in her having been lost there), and Cape Labrador, which, from its name, and being the last land mentioned, would evidently be at the southern entrance of the strait.

Second Voyage.—We will now proceed to consider the second voyage, which we may briefly introduce in the words of the journal preserved by Hackluyt (p. 622) :—"On Whitsundaye, beeing the sixe and twentieth of Maye, in the yeare of our Lord God 1577, Captaine Frobisher departed from Blacke Wall with one of the Queene's Majestie's shippes, called the Aide, of nine score tunne or thereabouts; and two other little barkes likewise, the one called the Gabriel, whereof Master Fenton, a gentleman of my Lord Warwicke's, was captaine, and the other the Michael, whereof Master Yorke, a gentleman of my Lord Admirall's, was captaine, accompanied with seven score gentlemen, souldiers, and sailers, well furnished with victuals and other provision necessarie for one half-yeare on this his second voyage," &c.

This little squadron watered at the Orkneys; after leaving which, on the 8th of June, they made Friseland on the 4th of July, and coasted it for four days. On the 16th of the same month land was made which the journal says "our Generall, the yeare before, had named the Queene's Foreland," a proof of the looseness of the first year's journal. Arrived at the entrance of the strait, Frobisher, with "two little pinesses," proceeded to the E. shore, while the ships lay off and on outside the barrier of ice, by which the strait was closed, at a great risk of being beset. The next day Frobisher regained his ship, and on the 20th of

July, a N.W. wind clearing the strait, "a faire harbour" was found for the shippe and barkes to ride in, and into which they entered, and called it Jackman's Sound, after the master's mate of the Gabriel, on the 20th of July. Here, as usual, formal possession was taken of the country, stones were piled up in different parts as the party proceeded on a journey of research for several days under Frobisher, who left his ships in the Sound with commands to the crews to be "obedient in things needful for safeguard to Master Fenton, Master Yorke, captain of the Michael, and Master Beast, his lieutenant."

It appears that this Jackman's Sound is by no means a secure anchorage, for the journal says, "We were forced sundry times while the ship did ride here at anker to have continual watch with boates and men ready with halsers to knit fast unto such ice which with the ebb and flood were tossed to and fro in the harbourough, and with force of oars to hale them away for endangering the ship;" by which it would almost appear that the Sound is open to a strong tide from the southward as well as the northward.

Having explored the country in the neighbourhood of this Sound, Frobisher crossed over to Warwick Sound, leaving the Gabriel, whereof Master Yorke was captain, and who, coasting "along the west shore with a party, and not far from where the ship rode, perceived a fair harbour, at the entrance of which they espied two tents of seal-skins." It was here that the disgraceful transaction took place of the murder of some natives, which has been so severely commented upon by historians; and although it must be allowed that Frobisher's people had reason to be incensed against the natives, having lost, by what they considered their treachery, five men with a boat the year before, still the whole affair is another proof of the barbarity of former days. The natives were attacked, and, several being killed, the point was called Bloody Point, and the sound Yorke Sound. Bloody Point, from the manner in which it had been approached by land from Jackman's Sound, would appear to form the eastern point of entrance to York Sound. On destroying their tents afterwards some of the effects belonging to their unfortunate countrymen were found.

From York Sound the ships proceeded across the strait to the eastern shore on the 3rd of August, and, arriving there next day, anchored in Anne Warwicke's Sound, which is called a fair harbour, and named after the Countess of Warwick. The remainder of this season was employed by Frobisher in freighting the ships in this sound with "such stone or gold minerall as he judged to countervaile the charges of his first and this his second navigation

to these countries, with sufficient interest to the venturers, whereby they might both be satisfied for this time, and also in time to come (if it pleased God and our Prince)," as the journal quaintly says (p. 626), "to expect a much more benefite out of the bowels of those septentrionale parallels, which long time hath concealed itselfe, till at this present, through the wonderfull diligence and great danger of our generall and others, God is contented with the revealing thereof. It riseth so abundantly that from the beginning of August to the 22nd thereof (every man following the diligence of our general) we raised aboveground 200 tunne, which we judged a reasonable fraight for the ship and two barks, in the said Ann Warwicke's isle." On the 24th of August the vessels departed on their homeward voyage. On the 29th of August the "Michael," one of the barks, was lost sight of "by occasion of great tempest and fogge." The former arrived safely at Yarmouth, and the latter at Bristol. On the 17th of September the Land's-End was discovered, and, the journal says, "so to Milford Haven, from whence our generall rode to the court, for order to what porte or haven to conduct the shippe." Orders were sent down a month afterwards for the "Aide" to go to Bristol, and by order of the Lords of the Council "the ore was committed to keeping in the castle there."

Third Voyage.—The belief that the lading of Frobisher's ship, the "Aide," was valuable treasure, led to a third expedition, on a far greater scale than any preceding. The account of this voyage by George Best, reprinted from Hackluyt, in Pinkerton's collection (vol. xii. p. 532), states that, "finding that the matter of the gold-ore had appearance and made show of great riches and profit, and the hope of the passage to Cataya by this last voyage greatly increased, Her Majesty appointed special commissioners, chosen for this purpose, gentlemen of great judgment, art, and skill, to look thoroughly into the cause for the true trial and due examination thereof, and for the full handling of all matters thereunto appertaining. And because that place and country had never heretofore been discovered, and therefore had no special name by which it might be called and known, Her Majesty named it very properly Meta Incognita, as a mark and bound utterly hitherto unknown." We have here the origin of the name of the country visited in these early voyages of Frobisher, earlier than those of any other British navigator. The expedition, although an entire failure in so far as the great object of obtaining gold was concerned, was of considerable importance in a geographical point of view, and its progress therefore deserves close examination, more especially as it does not appear to have yet received that attention to which it is entitled. We find the account

of it but a meagre attempt at a nautical journal, and even that fails us where most needed; but still the information which it does afford may be turned to account.

The number of ships composing this expedition amounted to fifteen, at the head of which was their "general," Martin Frobisher, in the "Aide." George Best says, "The said fifteen sail of ships arrived and met together at Harwich the 27th of May, anno 1578, where the general and the other captains made view and mustered their companies," and where certain articles of direction were delivered by Frobisher. These directions or articles for the guidance of the fleet are interesting in themselves, as giving some little insight to the state of the discipline of our ships in those remote times, but they are foreign to our present purpose.

Departing from Harwich on the 31st of May, the general descried land at two in the morning of the 20th of June, and found it to be West Frizland, and then named West England. A landing was made and possession taken of the country. Natives were seen with their canoes, which were said to be like those of Meta Incognita. This could be no other than Greenland, and the ships departed from it on the 23rd, first giving the name of Charing Cross to a high cliff, the last in sight, on account of a "certain similitude." On the 2nd of July the Queen's Foreland was seen, and, although the straits were blocked up by ice, the ships stood on and entered them. This was not done, however, without mischief: for the account says that the bark "Denis" was sunk, having struck against the ice; the crew were fortunately saved. But a gale came on from the S.E., which, pressing the ships among the ice, did them considerable damage, and from which they were released the following day by the wind coming from W.N.W., when "some were employed in setting up their topmasts and mending their sails and tacklings; again some complaining of their false stem borne away, some in stopping leaks, and some in recounting their dangers past, spent no small time and labour."

Such was the disheartening effect on these early navigators that we read,—"The whole fleet plied off to seaward, resolving there to abide until the sun might consume, or the force of the wind disperse, these ice [bergs] from the place of their passage, and being a good berth off the shore, they took in their sails, and lay adrift." Now the interval in which the fleet thus lay adrift appears to have been from the 3rd to the 7th of July, when the journal says, "As men nothing yet dismayed, we cast about towards the inward (Pinkerton, vol. xii. p. 539), and had sight of land, which rose in form like the northerland of the streights, which some of the fleet, and those not the worst mariners, judged

to be the North Foreland, howbeit some were of a contrary opinion."

Here the schism arose, and the question became, as there is no doubt of the vessels not being in Frobisher's Strait, as to what strait they really had entered. The ships at this time were steering a course along what was at first considered to be the N. side of Frobisher's Strait. But the journal continues, after complaining of the duration of fogs, and the deceptive nature of them upon the land, that they had been carried to the S.W. of the Queen's Foreland, at the southern entrance of the strait, and, "being deceived by a swift current coming from the N.E., were brought to the south-westward of our said course, many miles more than we did think possible could come to pass, the cause whereof we have since found."* We have here a direct admission that the ships were set to the S.W. during this time that they "lay adrift;" but if we look further, we find that they found a "swifter course of flood than beforetime they had observed; and truly it was wonderful to hear and see the rushing and noise that the tides do make in this place, with so violent a force, that our ships, lying a-hull, were turned sometimes round about even in a moment, after the manner of a whirlpool; and the noise of the stream no less to be heard afar off than the waterfall of London-bridge."

Our chief polar navigator, Captain Sir Edward Parry, bears ample testimony to the uncertain and violent nature of the tides in the particular part under consideration. It appears, from the published account of his second voyage in the Fury and Hecla, that Sir Edward first encountered here the difficulties which beset him on that expedition. After alluding to the flood-tide running W.S.W. 2 or 2½ knots, he observes, "the eddies and whirlpools, however, caused by the tide running at the rate of 4 or 5 knots, rendered the ships perfectly unmanageable." Again, he says, "the tide appeared to have been setting to the eastward from noon till 6 P.M., about which time it turned in the opposite direction; and soon after we hove to, the ships were carried by it into the ice, which formed their present impediment, at the rate of more than 3 miles an hour." The curious local effects of the tides differing from each other in parts very near together are remarked on. The ships being in company, "the Hecla was, by a different set of the stream, separated 5 or 6 miles from the Fury" (p. 9). On the following day Sir Edward remarks, "On the evening of the 7th we found, to our great surprise, that the Hecla had drifted 11 or 12 miles to the westward of us, though still beset in the ice." This

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* It is a remarkable proof of the southerly current to which the ships were exposed, and also of the indraft to the mistaken straits, that the wreck of the Denis was found by the ships in it.

circumstance appeared more extraordinary, the journal adds, "as the ships had been close together a few hours before, and shows in a very striking manner the irregularity of the tides in this neighbourhood." But it will be seen by the following extract that there is a general current to the S.W. in addition to the variety noticed above. Speaking at p. 10 of the same locality, Sir Edward mentions that the ships, having been both made fast to the same floe, "were found to drift from 1 to 4 or 5 miles to the southward daily, and rather to the westward." Now the interval in which the ships were thus secured to the same floe was from the 9th to the 16th of July, in which time the meteorological journal shows the winds to have been 3½ days southerly and S.W., directly against the drift; 2½ days easterly; and 2 days north-easterly; so that, had the ships not been prevented by southerly winds, or had they been more assisted by northerly winds, the drift to the southward might be expected to have been much greater. But all polar navigators seem to agree in stating the tendency of the waters in this part to flow to the southward, or, in other words, that the flood-tides from the northward run stronger than the ebbs; and Sir Edward Parry has preserved Fox's opinion to this effect, especially in a note which will be found at p. 20 of his voyage.

Now it is in this locality, and subject to this current, that Frobisher's vessels were exposed from the time that they were liberated from the ice in the entrance of Frobisher's Strait, on the 3rd of July, 1578, to the 7th July, when, as men nothing dismayed, "they cast about towards the inward, and had sight of the land." The distance from the southern part of the entrance of Frobisher's Strait to that of Resolution Island, on the northern side of the entrance of Hudson Strait, is about 60 miles, according to the view now taken of it; and it requires no great stretch of the imagination to suppose the ships to have been set in a southerly direction during the above interval, when they were recovering from the effects of the ice they had encountered; and this supposition will be assisted by the fact that they were blown out with a W.N.W. wind, which, if it lasted, would have much accelerated their progress. This, however, we have no clue to; but there is much concurrent testimony in the sequel, which seems to place it almost beyond a doubt that the "mistaken strait" of Frobisher, which has so long remained on the charts, was no other than Hudson Strait.

A number of the ships—for they had been much dispersed—had sight of land, which was first supposed to be the N.E. side of Frobisher Strait, the land bearing great resemblance to the "northerland" of this strait, and a point of land being made "which some mistake for a place in the Straights called Mount Warwick;" but as the ships proceeded to the westward, doubts

arose, and the general sent his pinnace on board the ships to obtain opinions of those who knew Frobisher Strait as to where they really were. The master of the "Anne Francis," James Beare, was consulted especially, and also Christopher Hall, author of the journal of the first voyage, which latter, we are told, "delivered a plain and public opinion, in the hearing of the whole fleet, that he had never seen the aforesaid coast before, and that he could not make it for any place of Frobisher's Streights" (Pinkerton, vol. xii. p. 539). On this two vessels put back, namely, the "Thomas Allen," having the Vice-Admiral, Captain Yorke, in which vessel was also James Hall, and the "Anne Francis;" but the general, Martin Frobisher, pushed on, and passed up 60 leagues within the said doubtful straits, bent, no doubt, on discovery; for it is said that, while he knew that he was not in Frobisher's Straits, he persuaded the fleet that they were in their right course. And it is also stated of him that he said afterwards, "if it had not been for the charge and care he had of the fleet and fraughted ships, he both would and could have gone through to the South Sea." This, perhaps, is sufficient to show that such was his real intention; and it is not unlikely that, had he continued onwards, he might have deprived Hudson of the honour of discovering Hudson's Bay.

George Best has given in his narrative of the voyage a formal dissertation on the general features of the mistaken strait of Frobisher, in which the proof that it was no other than Hudson Strait must be looked for. We have already accounted for the ship's having been drifted down to the entrance of Hudson Strait; and it appears that, once within that entrance, the progress to the westward was comparatively easy—a circumstance also observed by Sir Edward Parry. He says (p. 19),—"We continued to gain a great deal of ground, the ebb-tides obstructing us very little. Indeed, from the very entrance of Hudson Strait, but more especially to the westward of the Lower Savage Islands, it was a matter of constant surprise to find our dull-sailing ships make so much progress when beating against a fresh wind from the westward." Doubtless this facility of getting to the westward induced Frobisher to stand on. But we will now proceed to the facts stated.

First, the ships stood on, "having the main-land always on their starboard side" (Pinkerton, vol. xii. p. 541). But we will place in juxtaposition the comparison as it appears:

Frobisher's Mistaken Strait.	*Hudson Strait.*
"The further we sailed the wider we found it, with great likelihood of endless continuance."—Pinkerton, vol. xii. p. 540.	Widens considerably within the entrance between Resolution Island and Cape Chudleigh.

"Seemeth to have a marvellous great indraft. . . . . For here also we met with boards, laths, and divers other things, driving in the sea, which was of the wreck of the ship called the bark "Denis," which perished amongst the ice as aforesaid."—Pinkerton, vol. xii. p. 540.	This indraft is already confirmed by Sir Edward Parry.
"Some of our company affirm that they had sight of a continent upon their *larboard* side, being 60 leagues within the supposed streights." —Pinkerton, vol. xii. p. 541.	At 60 leagues within Hudson Strait the breadth is decreased to 15 leagues between the land called the North Bluff on the charts, on the starboard hand, and at the abrupt curve to the northward, on the larboard hand, which would render both shores visible at once; and, except at the entrance, this would not be the case anywhere proceeding up the strait.
"Howbeit, except certain islands in the entrance hereof, we could make no part thereof."	The Button Islands, and Green Island, in the entrance of Hudson Strait, correspond to these islands.

Much stress is also laid on the great rise and fall of the tide, as well as the strength of the current, which former, at a place within the straits, is stated by Sir Edward Parry to be at springs about 30 feet.

On returning to the eastward again, after passing several days in the strait, we are told the general "perceived a great sound to go into Frobisher's Strait." Now, as the ships might be supposed to be keeping the northern shore still, they would come to the opening, between the East Bluff of Parry and Resolution Island —of which a view is given by Sir Edward Parry—through which an enticing prospect was evidently offered to our navigators to seek their way into Frobisher Strait. Accordingly, the "Gabriel" was sent to explore it, and that vessel passed through into Frobisher Strait; thus proving, besides, that the Queen's Foreland is an island; and, moreover, she succeeded in getting into Warwick Sound before any of the other ships. But it would appear that Frobisher, with the rest of his ships, continued his way to the entrance of Hudson Strait, and suffered considerable delays in reaching that sound. The country passed by the fleet on their starboard, going up "Mistaken Strait," is stated to be "more fruitful and better stored of grass, deer, wild-fowl, &c., than any other part:" natives were also traded with, and boats of the country seen, with "twenty persons in a piece" (Pinkerton, vol. xii. p. 542). These may probably have been the same race of people met with by Sir Edward Parry.

The corresponding features of Hudson Strait and Mistaken Strait of Frobisher, here enumerated, may appear to be few: but that should not prevent their being conclusive, as few there are that can in reality be offered. Hudson Strait, after a narrow entrance of not 15 leagues in width, suddenly opens to an immense breadth, leaving it impossible that the land could be seen on the larboard hand, while that on the starboard hand was visible until 60 leagues within the entrance, when the breadth as suddenly contracts, and where both shores might at once plainly be seen. The islands passed also corroborate the presumption; and, lastly, the sound or channel inside of Resolution Island affords another concurring fact: all of which features seem to place it beyond a doubt that Hudson Strait is the Mistaken Strait of Frobisher. If this be not admitted, then it will be necessary to find another strait to which the same circumstances will apply to the southward of Frobisher's Strait within the limited distance of 60 miles—an undertaking which the known features of the land do not appear likely to admit.

It would perhaps carry us to an unnecessary length to follow the progress of the ships to Warwick Sound, where they severally arrived at different periods; and it would besides be introducing matter irrelevant to geographical information to follow them through the various difficulties which they had to encounter. But the voyage now under consideration was productive of more discovery, and more places were visited and named within the strait, than in both of the preceding ones; which names should be preserved. It will be sufficient, perhaps, to preserve the names of these places, and their relative positions, and to facilitate reference by arranging them in an alphabetical order at the end of this investigation. But, before concluding with the return voyage home, a little expedition, undertaken within the straits, and which seems to be the only one by which they have been explored, deserves being recorded.

Some of the ships had succeeded in getting within the straits and had found refuge on the southern shore among several islands, of which one was much larger than the rest, and from the quantity of black ore (supposed to contain gold) it afforded was named Best's Blessing. But the difficulties they had experienced had checked their ardour so much that murmurs ran high, and thoughts of returning home were loudly expressed by the crews, without endeavouring to follow the rest—among whom was the admiral—to Warwick Sound. A council was held in the captain's cabin of the "Anne Francis" on the 8th of August, at which it appeared that "the fearfuller sort of mariners, being overtired with the continual labour of the former dangers, coveted to return homeward, saying that they would not again tempt God

so much, who had given them so many warnings and delivered them from so many wonderful dangers; that they rather desired to lose wages, freight, and all, than to continue and follow such desperate fortunes. Again, their ships were so leaky, and the men so weary, that to amend the one and refresh the other they must of necessity seek into harbour." But Captain Best, of the "Anne Francis," resolutely opposed this proposal, treating it with the utmost disdain, and concluded an address to the people by saying that "it should never be spoken of him that he would ever return without doing his endeavour to find the fleet, and know the certainty of the general's safety." At last it was agreed that a harbour should be sought in this part of the straits, and then that a small pinnace, which was on board the "Anne Francis" in frame, should be set up, and accordingly, two days afterwards, some of the ships got into a harbour in the island called Best's Blessing. The construction of the pinnace was then completed, but in such a manner as not to satisfy every one as to her safety; indeed, the whole transaction affords a fair specimen of the determined perseverance of our best seamen in those remote times. It appears that those essential parts called knees had been omitted, and there were no nails to work with; but a smith was found among the crew, and we are told that "they were fain of a gun-chamber to make an anvil to work upon, and to use a pickaxe instead of a sledge to beat withal; and also to occupy two pairs of small bellows, instead of one pair of great smith's bellows; and for lack of small iron for the easier making of the nails, they were forced to break their tongs, gridiron, and fire-shovel in pieces." However, the pinnace was completed; and Captain Best, bent on finding the general, expressed his intention of proceeding in her to explore the Straits in quest of him. But some of the crew were averse to this, and tried to dissuade him, more especially the carpenter, who it may be supposed knew best what she could do, and who said "he would not adventure himself therein for 500*l*., for that the boat hung together only by the strength of the nails, and lacked some of her principal knees and timbers."

This did not deter Captain Best from his purpose, for on the 19th of August the pinnace started with him, accompanied by Captain Upcote, of the "Moon," and eighteen persons, who had been induced to volunteer by the example of John Gray, the master's mate of the "Anne Francis." It is related that, "being shot up about 40 leagues with the streights, they put over towards the N. shore, which was not a little dangerous for their small boats (? boat), and by means of a sudden flaw were driven, and fain to seek harbour in the night amongst the rocks and broken

ground of Gabriel's Islands, a place so named within the streights above the Countess of Warwicke's Sound." We can here obtain some idea of the length of the strait, the southern shore by this account being 120 miles; but perhaps something short of this, as the distance was estimated. Passing down the northern shore of the strait, a party, under Captain Fenton, of the "Judith," were discovered at a place named Sussex Mine, not 5 leagues above Warwick Sound, whither they repaired, and found the general; being received with joyful acclamations; or, in the words of the journal, "And truly it was a most strange case to see how joyful and glad each party was to see themselves meet in safety again, after so strange and incredible dangers: yet, to be short, as their dangers were great, so their God was greater."

A communication was now established—the ships left on the southern shore joined company, and in the latter part of August they departed homewards, arriving all safely in England about the 1st of October.

Subjoined is a list of places named by Frobisher, the record of which is preserved by Hackluyt, and his account of them quoted from the different voyages. The reference P. is to the twelfth volume of Pinkerton's collection; H. to the volume published by Hackluyt in 1689.

Beare Sound.—So called after the master of the "Michael." On northern shore of Frobisher Strait, about 5 leagues below Warwick Sound, and 25 leagues from the Queen's Foreland, P. 508 and 522. A sound upon the Northerland—a day across from Jackman's Sound—tides swift in it—drift ice, P. 521. Has an island near it, named Leicester Island, P. 521. In another of the small islands was found the corpse of a native. Captain Best, on his way from Warwick Sound to Hatton's Headland, set his miners ashore at Beare Sound. Busse, of Bridgewater, passed through it to northward, P. 555.

Best's Bulwark.—The corner of a cliff on Countess Island, in Warwick Sound, entrenched as a fortification by Lieut. George Best, Frobisher's lieutenant on second voyage. On three parts like a wall of good height, encompassed and well fenced with the sea, P. 527, second voyage. A house left on it in third voyage, P. 553. Nearly connected with the main or larger island, as at low water natives could nearly wade to it.

Bloody Point.—So called on occasion of the slaughter there. South-eastern point of entrance of Yorke Sound—about 4 leagues further within Frobisher Strait (on S. side) from Jackman's Sound, P. 524, H. (edit. of 1689) 626.

Best's Blessing.—A great black island on southern shore

at entrance of Frobisher Strait, whereon plenty of black ore was found, P. 550. Contains a harbour in which ships took refuge, and within which is a rock; the "Anne Francis" struck on it. P. 550, third voyage.

BURCHER'S (or BUTCHER'S) ISLAND.—Ten leagues from Thomas William's Island within Frobisher Strait, P. 492. Nearer perhaps to eastern than to western shore of strait. Ships were first on W. side of it, as they "waied," and went on 20th of August to eastern, H. 621, first voyage.

COUNTESS ISLAND and SOUND.—*See* Sussex and Warwick.

DAVID'S SOUND.—Mentioned, P. 508; perhaps between Beare Sound and Hall Sound.

DIER'S (or DYER'S) SOUND.—Calm and still water, H. 634; near Beare Sound, after Andrew Dyer, master's mate, P. 496; second voyage.

FIVE MEN'S SOUND.—Near to Burcher's Island, so called from five men and a boat being lost when sent on first voyage, to place a native on shore who had been captured; first voyage, P. 493.

FROBISHER STRAIT.—Fifty leagues in length, P. 512; land on either hand a great main or continent; also 60 leagues in length; in next hand to Hall's Island, and somewhat further up to the northward, P. 517. Narrowest part between Jackman Sound and Warwick Sound; between land and land, 9 leagues over at least, P. 525. A large entrance between Queen's Foreland and Hall Island, H. 623. Country on both sides very high, rough, stony, and mountainous, H. 629. Queen's Foreland being 62½°, and Hall's Island in 62° 50′, gives breadth of entrance, if N. and S., about 7 leagues.

GABRIEL ISLAND.—Ten leagues above Prior or Warwick Sound, P. 492; first voyage.

GOOD HOPE CAPE.—Perhaps the western point of Gabriel's Strait, P. 543.

GABRIEL'S STRAIT connects Hudson Strait, or Frobisher's Mistaken Strait, with Frobisher Strait, westward of Resolution of former, and island of Queen's Foreland in latter.

HALL'S ISLANDS.—Two in number—on northern side of entrance to Frobisher Strait, on which is North Foreland and Mount Warwick—small island near large one, P. 517; after Hall, master of "Gabriel." Is "divided from Northerland by a little sound called Hall Sound." P. 517. Hall Island, little less than Isle of Wight, standeth in the lat. 62° 50′; second voyage, P. 517.

HATTON'S HEADLAND.—Just within the straits on southern shore, P. 542; about 15 leagues over on western shore from War-

wick Sound, P. 553; highest land of all the straits—close to island called Best's Blessing, P. 551.

JACKMAN SOUND. — Named after master's mate, Charles Jackman, on western shore, P. 497. Contains an island named Smith's Island, from forge being first set up there—a very narrow passage between it and land, scarcely room for a ship to turn in it, P. 520, second voyage. Another small island in it also, P. 520; "lieth directly almost over against Warwick Sound, about 9 leagues over," P. 525. "Scarce 30 leagues within the streights," P. 525; "from the Queen's Cape, which is the entrance of the streight of the Southerland," P. 525.

LABRADOR CAPE.—II. 621. Journal says, after leaving Gabriel's Island, "We had Cape Labrador W. from us 10 leagues; possibly the outer cape or extreme eastern point of Queen's Foreland."

LEICESTER POINT.—P. 547, perhaps on southern shore near Hatton's Headland.

MOUNT OXFORD.—P. 547, perhaps near Hatton's Headland.

NORTH FORELAND.—On Hall Island, P. 517, divided from Northerland by a little sound called Hall Sound, P. 517.

PRIOR'S SOUND.—*See* Warwick Sound.

QUEEN'S FORELAND.—"An island near the supposed continent of America, P. 495; and on the other side, opposite to the same, one other island called Halle's Isle, after the master of the ship; near adjacent to the firm land supposed continent with Asia, between the which two islands there is a large entrance or streight, called Frobisher Streight, after the name of our general, the first finder thereof. P. 495, second voyage. See also P. 512. Standeth in lat. of 62½° to the northward of Newfoundland: a harbour in the island. II. 634."

SMITH ISLAND.—In Jackman Sound. "So called because the smith first set up his force (? forge) there." P. 521, second voyage. A small island.

SUSSEX ISLAND.—On which was a mine, by Beare Sound, P. 508, found by Frobisher, P. 509; third voyage.

THOMAS WILLIAM'S ISLAND.—Above Warwick Sound, P. 492. Boats rowed down to it from Five Men's Sound in one day. P. 493.

TRUMPET ISLAND.—Between Thomas William's Island and Gabriel Island, P. 493. About 6 or 8 hours' sail from Thomas William's Island, as the journal says, by "12 of the clocke at noone we were thwart of Trumpets Island." Ships left Thomas William's Island at daylight.

WARWICK MOUNT.—Journal says, "We arrived at length on the main of Hall's greater island .... and passed up into the

country about 2 English miles, and recovered the top of a high hill, on the top whereof our men made a column of cross stones, heaped up of a good height together....and honoured the place with the name of Mount Warwick, in remembrance of the Right Hon. Ambrose Dudley, Earl of Warwick." P. 518, second voyage.

WARWICK SOUND.—A fair harbour unto which is annexed an island on E. shore, called after Ann Countess of Warwick. P. 499, second voyage. A bay fenced on each side with small islands lying off the main, which break the force of the tides, and make the place free from any indrafts of ice. A very fit harbour for ships—not above 30 leagues from the Queen's Foreland, P. 522, in narrowest part of the straits, directly almost over against Jackman Sound.

WINTER'S FORNACE.—*See* P. 508.

YORKE SOUND.—After the master of the "Michael." On the W. shore not far from Jackman Sound, P. 498. About 4 leagues distant from Jackman's Sound, P. 523.

In addition to the foregoing, it may be inferred, from the fact of the ships running up Hudson's Strait by mistake, that the direction of Frobisher Strait generally is much the same as that of Hudson.

Since the foregoing was drawn up, I have been supplied, by the assiduous attention of Mr. Weir, the editor of the 'Transactions,' with a traced copy of a plan, in the library of the British Museum, representing, in the vague confused style of the time. the land named by Frobisher Meta Incognita, which appears to be divided by his strait. This drawing has been of service in confirming the positions which I had assigned to several places, although too limited to show the situations of many more mentioned in the account of the voyages. But the rude manner in which it has been drawn has also served to mislead some of our chart-makers of other days, who have evidently been content to follow it as nearly as they could without reading closely the account of the voyage. For instance, Hatton's Headland is written on the S. side of the island, forming Queen Elizabeth's Foreland, accounting for its appearing as the name of a headland at the entrance of Hudson Strait even in the charts used at present, while it is actually "just within Frobisher Strait on the southern shore."* It moreover confirms the conclusion already

* Cape Best is substituted for Hatton's Headland, as it appears on the plan above alluded to; and Cape Warwick has been substituted for Cape Resolution on the present charts, on the authority of Fox, p. 182.

arrived at, Hudson Strait appearing in it under the title of the "Mistaken Strait." The title of the drawing is as follows:—"Traced from the particular card of Meta Incognita in George Best's True Discourse of Frobisher's Three Voyages, published in 1578." The card is said to be "so farre forth as the secretes of the voyage may permit;" and the printer tells the reader that "some secrets have been concealed in the text as not fit to be published or revealed to the world, as the degrees of longitude and latitude, the distances and true position of places, and the variation of the compasse." The document is a curious one on the whole, and shows the idea of Frobisher, and which prevailed at the time, that the strait leading into Hudson Bay "trended to Cathaye."

The land N. of Meta Incognita, divided from it by a considerable strait, is called Greenland (Cumberland Island of Baffin); and "West Ingland *olim* West Frisland," an island, appears on the eastern side opposite the entrance of Frobisher Strait, adding still more confusion. This island is clearly the southern part of Greenland.

With reference to the chart accompanying this paper of the northern land above alluded to, a large inlet, which has been explored by the Lord Gambier, a whaler, under the orders of Mr. Wareham, and the name of Northumberland Inlet given to it, has been introduced into it, leaving the space between it and the islands forming the northern boundary of Frobisher Strait an entire blank. There appears, however, to be good reason for concluding that the space from Cumberland Island to Hudson Strait on the S., and Fox Channel on the W., consists of an archipelago of islands entirely unexplored since the voyages of these two early N.W. navigators. The discoveries of Frobisher, with the assistance of the sketch before alluded to, as named Meta Incognita, must be received on the chart as an attempt to supply, from very imperfect description, in the absence of all other information, some resemblance to what may hereafter be found; and a similar attempt might be made with advantage, even with the scanty materials which have been left by Fox, with the view of redeeming information which he has left us. But it is impossible to contemplate the imperfect state of the charts of this comparatively small portion of the arctic regions without cherishing a hope that in the course of time it may be considered worthy of the attention of a government which, beyond all others, has proved itself the parent and friend of maritime discovery.

Appendix to Captain Becher's Paper.

Northumberland Inlet; an Extract from the Journal of a Whaling Voyage, by Mr. Wareham, *Master of the Lord Gambier, of Hull.*

[The reference to this voyage in the close of Captain Becher's paper, and the introduction of Northumberland Inlet in the chart which accompanies it, appear to call for an extract from the journal explanatory of that addition. Whoever takes the trouble to collate Mr. Wareham's account of Northumberland Inlet, with the account of Cumberland Straits in Davis's 'Traverse Book,' published by Hackluyt, in the third volume of his general collection of Voyages and Travels (1600), will see good grounds to believe that these two names designate the same inlet. Davis, besides exploring this inlet, ran along the shore from Cape Walsingham to Cape Chudleigh, as close as the ice would permit. In the course of this run, which he describes as to the W. of S., he observed three inlets:—Cumberland Straits, Lumley's Inlet, between 62° and 63° N. lat., and an inlet immediately N. of Cape Chudleigh. The last mentioned is, beyond a doubt, Hudson's Straits; the Lumley's Inlet of Davis is, in all probability, Frobisher's Straits; and his Cumberland Straits the Northumberland Inlet of Mr. Wareham. Such an analysis of the voyages of Davis as Captain Becher has made of those of Frobisher would in all likelihood enable us, with the assistance of the observations of more recent voyagers, to lay down the coast and inlets between Cape Walsingham and Cape Chudleigh tolerably near the truth. A careful study of our old navigators would moreover have the advantage of throwing light on the confused nomenclature of these regions.—Ed.]

August 12*th*, 1841.—Lat. 65° 16′.

13*th*.—This day commenced with a fresh breeze. Atmosphere hazy, but horizon generally visible. Run to N.W. a few miles, and again to N.N.W. among open ice of a heavy description, while to the westward of us appeared a close pack of heavy ice that appeared to join the land. This was seen distinctly through an opening in the fog or the haze, and appeared distant from us at 3 p.m. 25 to 30 miles, bearing N.E. About this time perceived the ice to the north-westward much closer and very heavy, and in consequence hauled to the eastward in hopes of getting round it and finding a passage into Northumberland Inlet. A good deal of ice lay to the eastward of us, so on reaching a tolerably clear hole, at 9 p.m. shortened sail to dodge for the night. At 3 a.m. a whole gale put us under close-reefed topsails, with which we wared backwards and forwards among numerous heavy pieces of ice until near 8 a.m., when it was judged necessary to attempt to reach the open water to the eastward, though there was a complete drift of snow. Run to S.S.E. by S. among much

cross ice, and finding a heavy swell. About 10 A.M. reached the water, where the sea was found to be very high. Sun obscure.

14th.—About 4 P.M. the sky grew clearer, and the gale gradually abated. Made more sail after 8 P.M., and reached to E.S.E. until 2 A.M., when we tacked to the westward. About 8 A.M. the wind became light and variable. At 9 A.M. a breeze from N.W., made sail to reach to N.N.E. No land in sight. Lat. obs., 64° 6′.

15th—With a smart breeze we reached to N. by E. and N.N.E. till 9 P.M. At 9 P.M. hove to among some straggling ice. At 8 A.M. made sail to N.N.W., continuing on that course till meridian, passing through some open streams which lead into a large space of water. No ice in sight to N.N.W. Lat. obs., 64° 32′.

16th.—With a stiff breeze from E.N.E. we reached to N., going to leeward of some open ice, and at 3 P.M. made the land, Sanderson's Tower bearing N. by E. distant 30 miles. The breeze soon afterwards subsided, and for a short time it was nearly calm. After 8 P.M. we reached and run to N. about 20 miles. At 8 A.M. came to ice that appeared close; in consequence, hauled and dodged. Estimated distance from Sanderson's Tower about 20 miles; estimated lat. 64° 40′.

17th.—The fog continued dense till about 6 P.M. when it cleared up to westward, and in a few hours it also disappeared to eastward. Found that we were in a loose point of ice that lay off Sanderson's Tower, from which we were distant about 20 miles; its bearing N. The intervening space is occupied with the pack which is continuous along the land to the northward, and which is continuous as far as can be seen to the southward, or across the opening of Northumberland Inlet, appearing to present a complete bar to our entrance at present. The land wears a very wintry aspect; and the unusual quantity of snow on its surface shows little of the effects of summer. We have been endeavouring to get southward round the point of ice, or discover some opening to the westward, but the breeze being very light has prevented us making much way. Lat. obs., 64° 37′.

18th.—A very fine clear day. Breeze from N.W., W.S.W., and S.W.; light in the former part and middle part; latter part a moderate breeze. Reached to W.S.W. to leeward of the ice that seemed to cross the inlet, and at 9 P.M. tacked to the westward. Kept standing to N.W. until 8 A.M., and running among open heavy ice, though to the southward of us the open water was at no great distance. At that time the ice appeared to slack to N., and we steered on that course a short time, gradually keeping away a little more northerly. At meridian we are distant from the land on the S. side of the inlet about 18 miles; and a promi-

nent point is seen true S., distant about 25 miles. S.S.W. of that, other land is seen by refraction at a considerable distance. Queen's Cape and the land on the N. side of the inlet is in sight as far as Cape Albert. The intervening space is filled with heavy ice, but not altogether close. Several bergs have been passed, which are now to the eastward of us; and a few are within us, near to the land. A dark shade to the westward gives hopes of clear water in the inlet. All sail set with a fine breeze. Lat. obs., 64° 18′; long. by chron. at 5 P.M., 63°.

19th.—Run under all sail N. by E. among numerous pieces of heavy ice, having to haul within 5 or 6 miles of an island to the S. of Cape Mary Anne. After this found considerable slacks, and at 11 P.M. hove to among loose ice, on account of the darkness and a rather increasing breeze. At 3 A.M. bore away to N.E., and at 5 hauled to, the breeze suddenly increasing to a whole gale. Reduced the canvass to two close-reefed topsails, and lay to, head shorewards. At 7½ saw the land on the S. side of Batson's Bay, and wared to seaward. The atmosphere continued very dense on the W. side of the inlet, but cleared up to the E. about 10 A.M., and we made sail to N.E., the inlet to N. being quite clear of ice, except a few straggling pieces. At meridian blowing still a fresh gale. A little ice is in the vicinity of Gambier Island, which bears S.E. by E., distant 15 miles. The land about Kimmocksowick also in sight. Sun obscured.

20th.—With a strong breeze from the S. we ran to the N.E., edging towards the E. side of the inlet, and at 5 P.M. passed the islands in Keinate Bay, where was some loose ice. The atmosphere was tolerably clear until about 7 P.M., when it was hazy with some rain, and the breeze became light and variable, continuing so during the night. After daylight there was a light breeze from the N., but before 8 A.M. it had rounded again to S. We had attained midway between Keinate* and Jamieson's Mount when the wind changed, and, making all sail towards Bon Accord harbour, we have reached within 3 or 4 miles of it at meridian.

21st.—With a moderate breeze we ran past the small islands to the S. of Bon Accord harbour, and, though the fog was very dense, succeeded in finding the entrance; and at 3 P.M. brought up safely in 11 fathoms, being low water. Some Esquimaux in the vicinity. Obtained a few specimens of shell-fish.

22nd.—Several tribes or families of Esquimaux have come from the N. and taken up their quarters near us. Some ice appears at the harbour mouth, having set up from the S., for though it has been nearly calm with us, yet outside a breeze has prevailed.

* Qy. the same as *Kingite*, mentioned September 10 and 11?

23rd.—Lay at anchor. Hauled the dredge, and procured some specimens of shells and crustaceæ, but we see or hear nothing of whales. Sent a boat, under the guidance of an Esquimaux, to a salmon-fishing station. Esquimaux numerous.

24th.—The novelty of our appearance and consequent excitement having in some measure subsided among the Esquimaux, I took the opportunity of obtaining the attention of an elderly man, who appeared to be more active and intelligent, and not at all less boisterous in manner than any other of the tribe, in order to obtain some information relative to the route of the whales. He said the name of our present position was Annanetoote; and drawing the line of coast on the W. side of the inlet, named several Esquimaux fishing stations, of which Kimmocksowick was the principal. This we know to be situated about 65° 10′. He also traced the coast in a southerly direction to about lat. 64°, whence it appeared to trend due W. and again N., thus appearing to form another inlet, which is, perhaps, Cumberland Straits.* On the N. side of this inlet he marked an island of considerable dimensions, where he said deer is abundant. Into the inlet a large lake empties itself that abounds in salmon. No whales were seen in it. He also stated that no whales were to be found at our present station, except when land-ice occurred, and when the ice in the more southerly parts of the inlet was breaking up; but that the route of the whales was round Queen's Cape, and along the east land as far as Gambier Island, where they crossed the inlet and remained among the islets near Kimmocksowick till the ice set in for the winter. He stated that on the breaking up of the ice in spring, it generally separated a little above Kimmocksowick and stretched over to Gambier Island; at the edge of the floe whales abound in May. His account and description varied little in recapitulation.

25th.—At 4 A.M. sent a boat to the salmon fishery, having provided spears, &c., as the ground about the edge of the lake prevents the use of the net. Some heavy pieces of ice have set into the harbour; but, as there is very little tide felt, they have not given much annoyance. From the hills a good deal of ice shows to the S. Sounded the S. channel out of the harbour, where was sufficient water, but the passage narrow.

26th.—Several pieces of ice are now aground at the mouth of the harbour, being heaped up on the rocks, so that our egress would at present be difficult. The continuance of the wind from the S. has brought more ice up into the narrow part of the strait. We are now waiting a change of wind to sail down the neighbourhood of Kimmocksowick. The principal part of the natives have

* More probably Frobisher's Straits, and further south.—ED.

struck their tents and travelled S. The salmon-fishing party have not returned. Hauled the dredge and obtained more specimens of shells, and some fish that are new to us. Got some lichens and heather from the rocks for fuel.

27th.—A moderate breeze from N. Obtained with the dredge specimens of small fish and some shells, but nearly all of kinds already obtained.

28th.—The northerly wind gradually subsided, and after a few hours' calm a moderate breeze came on from the S. Got some heather, &c., as a substitute for coal, but it does not produce much heat. Some ice drifting about the harbour, but the tides being neap, some grounded pieces at the entrance prevent much coming in to annoy us. Only a few families of Esquimaux are now left here.

29th.—High water this morning about 4 o'clock.

30th.—Latter part of the day a light breeze from the N., which increased stiff towards meridian. The ice is now drifting to the S., and the pieces are nearly all gone from the harbour. Visited an island 4 miles to the N. to ascertain the state of the ice which appears open, and there is the appearance of clear water about the Seven Islands.

31st.—During four or five hours at the commencement of this day there was a fresh breeze from the N.; after 5 P.M. it gradually subsided. At 8 P.M. it was calm, and continued so till 8 A.M., after which a light breeze from the S. Clear weather, and although during the night the thermometer was at the freezing point, yet the sun has had more power this morning than we have felt for some time past. A slight skin of berg ice formed in the pools on shore, and also in the corners of the harbour. The ice is all open in the strait outside the harbour; and from one of the highest hills in our vicinity there is the appearance of a good deal of water about the Seven Islands. The remaining Esquimaux have gone southwards.

Sept. 1st.—One of the boats on the outlook at the harbour mouth reported a whale, to which it had been near. The fish seemed to have crossed the inlet from the E. side, and was going rapidly southwards. We had full moon this morning, and the tide last night was observed to flow at six o'clock.

2nd.—The breeze increased to a fresh gale (from S.S.E.); and the wind and flood-tide brought a quantity of very heavy ice into the harbour, which, coming in contact with the ship, rendered our position rather precarious. The anchor dragged; and in consequence, as soon as the tide slacked at high-water we weighed, and the breeze having subsided kedged a short way to the southward in the harbour, and anchored again at 7 P.M. The ebb-tide was found to run stronger than was expected, and some in-

convenience was felt from the drift of pieces of ice, though it was calm. In the morning flood again, a good deal of heavy ice came in, but without much strain on the anchor. At ebb-tide, however, a large piece caught the ship, and again brought the anchor home. About 10 P.M. it slipped clean, and we lay pretty comfortable the remainder of that tide. The pieces have grounded at the harbour mouth so as almost to block us in; the shore at low water is lined with heavy pieces of ice, and a quantity shows in the inlet.

3rd.—An Esquimaux family or two have made their quarters here, on their route to Kimmocksowick. An Eider-duck and some dovekies have been killed, and a jer-falcon seen.

4th.—A stream of heavy ice has drifted with the tide backwards and forwards across the entrance of the harbour. The southernmost passage from the harbour is filled up with grounded ice, and no prospect of its opening till next spring. To ascertain the state of the ice further down the inlet, sent a boat away in company with one from the Lady Jane,* to some islands that form the N. point of the Bay of Islands, about 17 miles distant. An Esquimaux guide accompanied them. Some white whales seen in the harbour. Some swans were observed steering their course southward. Berg ice formed in the harbour: therm. at 30° during the night. Got some heather, lichen, &c., for fuel.

5th.—The boat sent to the southward returned and reported clear water in sight from the island they visited, 16 miles from the ship, the ice being slack all the way to it. No ice was in sight for 30 miles to the S. of this stream, which crosses the inlet from the E. side to the Seven Islands. The tides do not appear to have taken off: the rise and fall being about 25 feet.

7th.—In consequence of information received from an Esquimaux, who arrived alone in his canoe, respecting some whales he had seen a day or two ago to the northward, sent some boats away at 8 A.M. under his guidance. Rowed in company with them to Swan Point, where the ice, acted on by the ebb-tide in the narrow, was carried about in a frightful manner. In a short time it was nearly all out of the strait, and drifted down as far as the harbour. No ice was seen in the upper part of the inlet, so that, were we favoured with a N. wind, this part of the sound would soon be quite clear.

8th.—At 4 A.M. the boats returned, without having seen any whale, though they had been 20 miles from the ship.

9th.—A moderate breeze in the former part of the day brought some ice into the harbour; but the wind falling towards high water, and the tides being neap, we were not much annoyed by it.

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* The consort of the Lord Gambier.

10*th*.—Got under weigh at 6 A.M., proceeded through the passage on the S. side of the outer island; and at 7 A.M. attained a fair berth off the rocks, and steered among open heavy ice towards the Seven Islands under all sail, and favoured with a fine breeze. At meridian the outermost of these islands are distant from us about 6 miles, bearing (by compass) W. The same kind of ice is all around, except towards the Bay of Islands, where clear water or large lanes are discernible from the mast-head, and towards the land N. of Kingite Bay, where also there are considerable spaces of water. No whales are to be seen, and indeed little of animated nature appears. Several icebergs are hereabouts, having, together with the ice, been set up by the long-continued southerly winds. Lat. obs., 66° 4′.

11*th*.—With a moderate breeze we ran past the Seven Islands at 2 P.M., and hauled to the westward towards the Bay of Islands, where we found a considerable space of water, and running along the land passed Cape Truelove at 8 P.M. Soon after it became nearly calm, and continued so till about 4 A.M., when a breeze came on from the S., which soon showed symptoms of increasing. Plied along the land within some slack ice, and among many straggling pieces, most of them heavy. At 9 A.M. tacked about ½ mile S. of Comet Island, and towards meridian we are reaching among ice, under single-reefed topsails, to the eastward towards Kingite Bay.

12*th*.—The fresh breeze increased to a strong gale that forced us to close-reef at 4 P.M. We had by this time weathered a point of ice, and found a considerable space of water. We were directly to the E. of Comet Island, Gambier Island, Cape Albert, &c., in sight. In this space of water we wared backwards and forwards during the dark watches, not without apprehensions of the lee-shore, for the wind set nearly directly into Kimmocksowick Bay. Frequent snow-showers prevented us seeing the land until day-break, when the ship was found to be 6 or 7 miles to windward (S.E.) of Comet Island. Our range of vision was nearly limited to the E. side of the inlet; since 8 A.M. there has been thick snow, but the gale moderated about 2 A.M., and more sail was made. Some bergs have been seen. Sun obscured.

13*th*.—Reached to S.W. for three hours, passing to windward (S.E.) of Comet Island. Tacked to E.; but the atmosphere being hazy, with snow and rain, the land was only occasionally and indistinctly seen. The wind inclining more northerly through the night, and being very light, ran through some slack ice to the S.S.E., and finding a space of water, about 2 A.M. hove to until daylight. At 7 A.M. we were distant about 6 miles from Gambier Island. Some close ice showed along the land to the E.; and as there was no prospect of whaling, steered W. among

open ice to find a passage outwards. At meridian we find ourselves within 2 miles of the W. land, near the bay S. of Batson's Bay, with the ice close to the land, but slack to the S. as far as can be seen: make sail in that direction.

14th.—The snow dispersed, and we found room among open ice to run along the land till 8 P.M., when the breeze subsided; and through the night there were light breezes from the S. Continued running through the open ice during the dark watches, and at daylight perceived clear water distant from us about 8 miles. The breeze subsiding, again sent the boats a-head to tow the ice, being very slack without Queen's Cape, from which we were distant about 15 miles; but towards the S. land a good deal of it seen, and rather close. At meridian we were distant from the edge of the ice about 4 miles. Some high-finned cachelot, but no mysticete, seen. Lat. obs., 64° 40′.

15th.—Wind S.S.W. and S.S.E. After towing about 2 hours, reached the water, and taking up the boats made sail to ply to windward, having at that time Coburg Rock considerably open, off Queen's Cape. Several bergs; some pieces of broken and also of heavy ice are drifting about, while a close stream lies along the land, and surrounds the rock. A heavy point stretches out to the E. from the N. side of the cape, and forms a bight, into which we are stretching at meridian. The upper part of the land is capped with snow-clouds; and at meridian the rock bears S.S.W., distant 10 or 12 miles. Some of the islands further N. are also seen. Sun obscure.

II.—*Observations on the Topography of Troy.* By Dr. P. W. FORCHHAMMER. To illustrate a Map of the Plain of Troy, made by Mr. T. A. B. SPRATT, Mate, under the direction of Mr. THOMAS EVANS, Lieut. R.N.

[Communicated through Captain BEAUFORT by Mr. THOMAS GRAVES, Lieut. R.N., F.A.S., F.G.S., &c. &c., Commanding Her Majesty's Surveying Vessel Beacon, and at present in charge of the Archipelago Survey.]

THE Plain of Troy resembles in many respects all the larger plains of Greece and Asia Minor. They are bounded on three sides by mountains, and on the fourth are open to the sea. Each of them is intersected by a river issuing from the range of mountains opposite to the sea, and running in a parallel direction to the ranges on both sides of it. Towards the lower extremities of the plain are generally brackish lakes, only separated from the sea by small banks of sand, which admit of the water carried off by

evaporation being replaced by that which filters through. These lakes vary in size according to the dimensions of their respective plains, but are in general deep enough to admit of fisheries. Such plains as have but a trifling slope from the base of the central range to the sea are necessarily much exposed to inundations. The Plain of Troy, although in its general character it closely resembles this common type, is marked at the same time by features peculiar to itself.

The mountains which bound the plain on three sides consist for the most part of a sandy limestone. Their ascent is gradual, except in a few instances, where the naked rock springs abruptly from the alluvial soil, forming isolated hills. The mountains do not, like those in most Grecian plains, terminate in peaks or sharp ridges, but form an elevated table-land, covered in many places by a deep and fertile soil. Near the Kimar the rock is decidedly of a volcanic character; and judging from the numerous small villages and huts in this neighbourhood, the soil must be more fertile than the clayey soil which predominates all around. The soil of the plain is a very rich alluvial clay: indeed sand is only found in a very few places, either in the upper or the lower plain. Where it does occur, it forms little hillocks, near the rivers, and particularly near the Kalifatli-Asmak.

The sea, too, which bounds the Plain of Troy on the N., differs in character from that which terminates most Grecian plains. There is no current in the Mediterranean so strong and rapid as that of the Hellespont. This current runs at the mouth of the Mendere, from E. to W., and the river discharges its waters in a westerly direction. Immediately E. of the mouth of the Mendere, however, the Hellespont widens considerably, and a strong counter-current from W. to E. sweeps the shore of the Plain of Troy from that river to the Rhætean promontory.

The main river is larger in proportion to the extent of the plain than is usually the case with Grecian rivers. There are also an unusual number of smaller rivers, torrents, and springs: the springs in particular are uncommonly abundant.

The course of the Mendere, like that of the rivers of Kleone, Nemea, and Sicyon, of the Alpheios, Eurotas, and Pamisus, may be divided into three parts. Descending from the innermost recesses of the mountains, it first falls into a large plain in the interior of the country, then passes through a very narrow valley, formed by the lower branches of Mount Ida, and thence issues into the lower plain. It is principally by the contributions of the springs and streams of the upper plain that the Mendere is kept flowing during the whole summer, like the Eurotas and Alpheios. It is, however, larger than either of these rivers, and may boast not only of a perennial stream of water, but also of a

deep and well-defined bed all the way down to Kum-Kaleh. This bed, which consists of mere sand, while the soil of the plain is clay, is from 200 feet to 300 feet broad: its banks vary from 8 feet to 12 feet in height, and are partially covered with willows and other trees. During the driest season the water cuts into the sand: in the month of August the stream was on an average from 30 feet to 40 feet broad, and ¾ of a foot deep.

The Bunarbashi-Su is the next river in point of importance. It is known since the time of Chevalier that among the calcareous rocks below the village of Bunarbashi there are a great many copious springs, remaining constantly at a temperature of 63° or 64°, and consequently appearing cold in summer and warm in winter. The water from these springs forms a river, not very broad, yet large enough by its inundations to convert the adjoining part of the plain into a marsh, through which it runs in a defined bed, whirling and eddying, although its right bank is for the most part nearly level with the surface of the stream. This river, after passing through its own marshes in a direction parallel to the Mendere on the E., and the mountain-ridge on the W., is carried off westward to the sea, through an artificial channel, which commences at the N.E. corner of the slope upon which the Ujek-Tepe is situated, and terminates to the S. of Beshika-Tepe (Cradle-hill). At the eastern extremity the banks on the right side of this canal are so low that even during summer they are overflowed in some parts: midway the banks get higher: at the western extremity the water spreads and forms a marsh, from which a stream discharges itself into Beshika Bay.

E. of the Mendere, and N.W. of the new Chiflik of Akchi-Kevi, at the foot of three hills, in which a branch of the Chiblak range terminates, is a marshy lake, fed by springs called by the natives Judan (a water that never diminishes). From the Judan issue three Asmaks.* Two of these flow N. of W. towards the sea; the third flows in an opposite direction, and falls into the Kimar-Su.

The more easterly Asmak of the two which hold their course towards the sea, flows close to the base of the Chiblak range, and joins the other near the western termination of the branch of these hills, on which the Pasha-Tepe is situated. This eastern branch we will call the Pasha-Tepe-Asmak, there being no other land-mark near after which to name it: the other is called by the natives the Kalifatli-Asmak. The Kalifatli-Asmak has a deep and very sharply-defined bed, from its source all the way

* Asmak is a term applied to channels which contain running water in winter only, and standing pools in summer. The beds of the Asmaks in the Trojan plain are commonly cut by the water through the flat soil, so that in many places they are not visible before you reach the edge of the steep bank.

down to the sea. In the month of August the water from the Judan does not preserve the character of a continuous stream further than about a mile from the lake. Lower down the channel was dry in some parts, and overgrown at the bottom with brushwood and rushes; in others it was filled with pools of stagnant water. In the upper part the course of the river may be traced by the line of trees which borders its banks; but in the lower part the bed is scarcely discerned before you reach the edge of its steep bank. The Kalifatli-Asmak does not come down from the mountains, nor does it fall into the Mendere, as has been erroneously represented by former topographers and map-makers. It issues from the Judan in the plain; and it is only during the period of the winter inundations that its waters mingle with those of the Mendere, and then in consequence of the latter overflowing and quitting their natural bed. Although the Asmak, after passing between the village of Kalifatli and the ruins of *Ilium recens*, now called Hissarjik, is forced by the slope of the Rhætean ridge to make a great bend in the direction of the Mendere, and is thrown very close to that river, not even the smallest of the arms into which the former is divided at the lowest part of the plain fall into the latter; but all flow into two lakes of salt-water, near the shore, the eastern branch being the most considerable. To the N.W. of Hissarjik, and under the ruins so called, the Kalifatli-Asmak joins the Dumbrek-Chai. This river takes its name from the village of Dumbrek, situated on its banks, at the upper end of a large and beautiful plain, extending from W. to E., between two mountain-ridges, of which that to the N. may be called the In-Tepe ridge; that to the S. the Chiblak ridge. Above the village of Halil-Eli the water of the Dumbrek-Chai disappears under the pebbles and sand; but as it rises again and forms a perennial stream from below that village to where it is lost in a marsh near Hissarjik, the inhabitants call it *Chai* or *Su*. Before entering the marsh, it divides into several small arms, and passes through a little wood. In the month of August the marsh contained water only in the upper part; the lower was dried up by the heat, and full of broad deep cracks. Further down some small channels show themselves here and there, which gradually unite and form a deep bed, like that of the Kalifatli-Asmak, which it joins a little above the village of Kum-Kevi. Below the village of Halil-Eli, a smaller arm branches from the Dumbrek-Chai, which flows close to the base of the Rhætean ridge, and after widening into flat marshes, like the Dumbrek-Chai, collects its waters again into a defined bed, and turns to the N. at the western extremity of the ridge. At the turning, an artificial channel from the Kalifatli-Asmak joins it; and the great accession of water received through this channel

during the winter season is the principal cause why the bed of this arm of the Dumbrek-Chai, which we will call the In-Tepe-Asmak, suddenly gets larger, and terminates in a broad opening towards the Hellespont. The mouth of the In-Tepe-Asmak has steep banks, is deep, and at all times filled by the sea, resembling a harbour more than a river, and on this account it is called by the Turks Karanlik Limani.

The Kalifatli-Asmak, though at some distance from the eastern hills, flows in a direction parallel to their base. The sudden and wide bend which it makes at the mouth of the Dumbrek valley can only be accounted for by a prolongation of the declivity of the Rhætean ridge. The In-Tepe-Asmak must have taken the same course, had it not by keeping a higher level in the Dumbrek valley found an intermediate depression, through which it obtained a shorter outlet to the sea.

The third outlet of the Judan, which we will call the Akchi-Keui-Asmak, falls into a marsh of the Kimar, and communicates by the channel of that river with the Mendere.

Great confusion has been introduced into the topography of Troy, through the mistakes of travellers with respect to the Kimar or Kamara. Mr. Turner* evidently gives that name to the Pasha-Tepe-Asmak. Dr. Hunt† calls the Kalifatli-Asmak the Kamara. It is the most remarkable river on the route of Dr. Carlyle,‡ who alters its name, however, to Slaimar; and Lady M. W. Montague and Mr. Sandys have called it Simores. The river named Kimar or Kamara by Count Choiseul Gouffier does not exist at all; but the river which he places next to it and calls Thymbrius, is the Kimar. Some of these errors have had their origin in the anxiety of travellers to identify existing names with those they found in the Iliad; others, in misapprehension of the information received from the natives. The Greek for an arch is καμαρα (*kamara*). The Turks have adopted the word, which they pronounce Kimar; and hence any water spanned by a bridge or aqueduct is called Kimar-Su, or, in the pronunciation of the Greeks, Kamara-Su.

There is no doubt that, commonly speaking, the inhabitants mean by the name Kimar, or Kimara, the river so designated in Mr. Spratt's map which these notes are meant to illustrate—the south-easternmost tributary of the Mendere, in the lower plain. The Kimar-Su has its name from a magnificent arch or aqueduct, founded on high rocks, 55 feet wide, and rising 92 feet above the bed of the river, which crosses it about 5 or 6 miles above its junc-

* Journal of a Tour in the Levant, vol. iii. p. 224.

† Walpole's Memoirs relating to Turkey.

‡ Rennell's Observations on the Topography of the Plain of Troy, Map No. 5; cf. p. 33.

tion with the Mendere. Below the aqueduct the stream flows in a very narrow valley, between high mountains covered with a wild and luxuriant vegetation, and at the distance of 2 miles turns a mill called Halil Beg's mill. From the mill it passes between high volcanic rocks, of a red hue, passing at some places into black: 2 miles from the mill the valley becomes so narrow that the common road turns to the left across a hill, on which are some nameless huts, built of rough stones, without mortar, with nothing about them to indicate their age or origin. On descending into the plain, the bed of the Kimar was found quite dry in the month of August. Ascending the gorge from this point to where the road struck off from the river side, a continuous stream was found flowing among huge blocks of stone, between high steep crags, which approach so near that some plane-trees which have taken root among them on either side touch, and give to the narrower valley somewhat the appearance of a cave. In the plain the bed of the river increases in breadth, and after passing the last height to the N. divides into three arms which re-unite near the Chiflik of Akchi-Kevi, where the water begins to re-appear at intervals. About 100 yards farther on the river passes through a little marshy wood called Baluk (a place for honey), at the lower end of which the channels of the Akchi-Kevi-Asmak meet those of the Kimar. The marsh was quite dry in the month of August; but a deep and well-defined bed, with a smaller one by its side, could be traced from it to the Mendere, through which the waters of the Kimar and Akchi-Kevi-Asmak find their way in the wet season.

In addition to these watercourses the plain contains a number of swamps and marshes. Those which contain permanent lakes have been already noticed: they are, on the W. side of the Mendere, the marshes surrounding the springs which form the Bunarbashi-Su, and on the E. side, the sources of the three Judan Asmaks. Both are on a higher level than that of the central plain; the Bunarbashi swamps are much more extensive than those of the Judan. In addition to them the Bunarbashi-Su forms some marshes in its lower course by overflowing its artificial banks; and when in winter it breaks into the ancient channel which appears originally to have conveyed its waters into the Mendere, it fills an extensive swamp near Yeni-Kevi, which produces a great quantity of reeds. In the month of August this swamp was sufficiently dry to admit of a man passing through it. Indeed it is evident from what has been said above, that, with the exception of the main river, all the watercourses in the plain of Troy widen at their lower extremities into marshes, which in winter are swampy or full of running water, and in summer hard as stone, and cracked like a cake of wax. The Mendere having a deep bed and more abundant supply of water does not

terminate in the same way. In the time of rains, however, it overflows its banks as high up as the parallel of the Judan lake, and forms a swampy river midway between its natural bed and the channel of the Kalifatli-Asmak, as may be seen indicated on the map. This inundation river has cut for itself a deep defined bed near Kalifatli, but presents for the greater part of its course the appearance of a broad shallow sheet of surface water. The part of the plain thus covered is easily recognised in the driest time of summer by a different kind of grass from what grows where the inundation does not reach.

Another kind of reservoir remains to be noticed—the salt-water lakes or lagoons at the lower extremity of the plain. During the summer, when there is little water in the Mendere and none at all in the Asmaks, the mouths of their channels are filled with salt water. At the mouth of the Mendere is a large lake with a small outlet, which the current of the Hellespont turns to the W. The lake immediately to the E. might be called the mouth of the inundation river of the Mendere, as its water finds its way into this reservoir by several channels. During the summer, when there is no influx of water, this lake is separated from the sea by a low sandy bank. It is very deep, and filled with salt water. The next lake, still proceeding eastward, is of much greater extent, and probably of greater depth also: into it the broadest and deepest arm of the Kalifatli-Asmak discharges itself. There appears to be a permanent communication between this lake and the sea. When I passed along the sandy bank which separates them in the month of August I was obliged to cross a deep channel, through which a current was at that time running with great velocity from the sea *into* the lake. The salt water extended more than ½ a mile up the bed of the Asmak. The defined beds of the rivers, or asmaks, do not reach close to the lakes into which they fall, but their banks are high and steep as far as they do extend; the bottoms of their channels are depressed considerably below the general level of the plain.

Only two of the rivers of the plain contain running water in the driest season of the year—that is, in the months of August and September. It may happen in a very dry summer that the bed of the Mendere dries up, as seems to have been the case when it was seen by Dr. Sibthorpe, in September, 1794; but the inhabitants assured me that this river at all times, even in the heat of summer, has a small shallow stream of water; and this was certainly the case when I saw it in the month of August. The Bunarbashi-Su is in the driest season a continuous stream, 3 feet deep where shallowest, and in many parts much deeper. At this time of the year, the corn having been gathered in, there remains only some sun-burnt grass on the surface of the hard clayey soil

of the plain; but all along the main river, and at intervals in the beds of the smaller water-courses, its banks are lined with beautiful trees.

There is no other plain in Asia Minor so much subjected to the influence of water as the plain of Troy is in the rainy season. The Mendere begins to rise as soon as the rains commence in the upper regions of Mount Ida. At its entrance into the lower plain it receives a considerable accession from the Kimar, which, rising far up in the mountains, is also affected by the early rains. The subterranean veins and channels of the mountain which feed the springs of the plain will also be gorged with water, and the probability is that even in this early part of the winter the three Asmaks of the Judan become large and continuous streams, the Akchi-Kevi-Asmak becomes an acting tributary of the Mendere, and a portion of the waters of the Bunarbashi-Su overflow its low eastern banks, and find their way into the bed of that river. As the winter advances the clouds fall down upon the lower Ida, and ultimately discharge themselves over the whole plain. With the exception of what is carried off by the artificial channel of the Bunarbashi-Su, the whole of the water of this side of Mount Ida is drained into the plain of Troy. The Mendere overflows its banks and forms the inundation river mentioned above. The rains of winter are generally accompanied by strong winds from the S.W., which obstruct the current of the Hellespont, and raise the sea-water above its ordinary level at the mouths of the Mendere and of the two Asmaks, thus impeding the current of the rivers and increasing the inundation in the lower part of the plain. The inundation thus created is permanent during the winter. At first it only covers the part of the plain adjoining the salt-water lagoons and the mouth of the Mendere, and up to the high steep banks of the Asmaks. In time, however, the extensive plain in the interior of Mount Ida, between Ené and Bairamiché, is converted into an immense lake, of which the narrow valley through which the Mendere flows between Ené and Bunarbashi is the only outlet. In this passage the water sometimes rises in winter 30 or 40 feet above the bottom of the river's summer bed, as may be seen by the grass left adhering to the trees on its banks. The whole plain of the Mendere is submerged, and at times even the valleys of the Kimar and the Dumbrek are overflowed to a considerable height. In them, however, the inundation rarely continues longer than five or six days at a time; but it recurs at frequent intervals during the rainy season.

This annual alternation from excess of dryness to excess of moisture is not the only cause of change in its superficial conformation to which the plain of Troy is subjected. The cold is almost as extreme in winter as the heat in summer. The mountains are

covered with snow, and the waters of the plain with ice strong enough to bear men, and even horses where there is no current to prevent it from getting thick. In short, there is no district in Greece or Asia where the war of the elements is carried on so powerfully and under such a variety of forms as in the plain of Troy. It is only by distinguishing the different characters this plain assumes at different seasons of the year that a complete knowledge of its topography can be attained.

Next in importance to the natural features of the plain, for the student of comparative geography, are the vestiges of ancient structures scattered around it. There are ten unquestionably artificial tumuli *round* the plain; *within* it there are none.

Coming from Greece the first seen is the Ujek-Tepe, commonly called the tumulus of Æsyetes; it is situated on the slope of the Kara-Dagh, on the highest part of the ridge between Besika Bay and Bunarbashi. Close to it on the N. are some remains of a wall which have not hitherto been noticed by travellers.

A second tumulus is situated on the Sigæan ridge, near the eastern extremity of the artificial channel which conveys the waters of the Bunarbashi-Su to the Egean. This mound is called by the Turks Beshika-Tepe (cradle-hill), and from it Beshika Bay derives its name. On a point of land to the W. of this tumulus some remains of uncertain date (Palaio-castro) are supposed to mark the site of Agamia.

The eminence on the middle of the Sigæan ridge, near Yeni-Kevi, sometimes called the Agios-Demetrios-Tepe from the roofless church by its side, is evidently natural, and ought not to be numbered among the tumuli. The third tumulus therefore is that which is commonly called by travellers the tomb of Achilles, situated on the slope of the northern termination of the Sigæan ridge; the fourth, that of Patroclus, is a little lower down on the same slope. They are both artificial, and are called by the Greeks the two hills (τὰ δύα τεπέ). The tumulus of Achilles was opened by order of Choiseul Gouffier, but unfortunately the operations were not superintended by any competent person. The excavations appear to have been merely superficial, and towards the summit of the mound. Some antiquities which were sent to Constantinople led Choiseul Gouffier to take it for the tumulus of Festus, the murdered friend of Caracalla, and to call an eminence in the Turkish burying-ground, near the bridge of Kum-Kaleh, the tomb of Achilles: in this he was mistaken, for that eminence is decidedly natural.

The fifth tumulus is that of Ajax, now called In-Tepe, at the north end of the Rhætean promontory. This monument had been broken into before it was visited by modern travellers, and it

is still in the same condition in which Le Chevalier found and described it. There are some other mounds on the northern side of the Rhætean ridge, not far from In-Tepe, strongly resembling the artificial tumuli, but which have not yet been examined.

The sixth tumulus is called the Pasha-Tepe; it stands on the slope of the Chiblak range, and is the same which Choiseul Gouffier, after Demetrius of Scepsis, has named the tumulus of Æsyetes.

There are no artificial tumuli between the Pasha-Tepe and Bunarbashi. The three tepes near Akchi-Kevi are natural hills. Some doubts may exist as to the character of the Kanai-Tepe, about five minutes' walk from the Chiflik of Akchi-Keui, in the direction of Bunarbashi, but its immense size renders its being artificial improbable. Excavation alone can settle this point.

The seventh, eighth, and ninth tumuli are on the top of the rocky eminence above Bunarbashi, a little outside of the thick wall which separates them from the Acropolis. They consist of natural stones broken from the rock on which they stand: at the side of each is a deep pit, apparently artificial. Near the most southern of these three mounds is a circular foundation resembling a threshing-place.

The tenth tumulus is on another mound of the same ridge, more to the W. Close to it is the foundation of a long straight wall about 1½ foot thick.

All these tumuli are unquestionably of very ancient date. No excavations of moment having yet been made in them, their positions alone afford matter for remark and conjecture. Not one of them is situated in the plain; in general they stand upon the slope of a mountain ridge; and they are all near the sites of ancient towns: most of them are near fountains or wells: they may have been buildings intended to preserve water during summer and keep it cool for drinking, or they may have been consecrated to the water deities.

Next in order to these mounds may be noticed some excavations apparently intended to relieve the plain of its superfluous waters, and diminishing the force or shortening the continuance of the inundation, of as uncertain date and perhaps as old as the tumuli. The first is the artificial channel already noticed through which the waters of the Bunarbashi-Su are conveyed into the Egean. If travellers had inspected this work closely, they would have seen that it is cut for a considerable distance through a thick layer of rock, and must have been convinced that the turning a poor Turkish mill could never have offered sufficient inducement to such a laborious undertaking, or repaid the time, outlay, and labour expended upon it. Besides, the circumstance

that a great part of the plain on the W. of the Mendere is preserved from constant inundation by this diversion of the water, sufficiently indicates its real object. No Turk or Turkish governor ever undertook so bold and toilsome an operation. A similar channel has been cut at some unknown period across the promontory of Sigæum, between the modern village of Yeni-Kevi and the hillock called Demetrios-Agios-Tepe in the middle of that promontory. The length of this channel is nearly half a mile: its banks must originally have been 100 feet high; its width is about 100 feet. It is now filled to the height of 10 or 15 feet with earth, and centuries must have elapsed since any benefit was derived from it. Such excavations are among the earliest works of mankind. We know of nothing more ancient than the canals of Egypt; the subterranean channels of the Copaic, and the emissaries of the Alban lake, are understood to be of very ancient date. The liability of the Trojan plain to inundations would, at a very early period, suggest to the inhabitants the utility of thus relieving it from a portion of its superfluous water. In short, every thing tends to suggest that these channels must belong to a period of more remote antiquity than has generally been supposed. Besides these two great artificial channels there are a number of smaller ones in different parts of the plain. The small parallel channels which connect the ancient or winter bed of the Bunarbashi-Su with the Mendere, are evidently the work of man. It is impossible to assign a date to them, but they may be very old, because the clayey soil gets so hard as soon as the water in them is dried up, that their shape is preserved in summer by the sun's heat, as in winter by the running water. The artificial channel connecting the Kalifatli-Asmak with the In-Tepe-Asmak, is intended to carry off the water brought down by the inundation of the Mendere from the village of Kalifatli.

The remains of ancient towns in and around the valley of the Mendere remain to be considered: I will begin, as with the tumuli, at Ujek-Tepe, and after proceeding to the N., return to the same point by the opposite side of the plain.

On the N. side of the Ujek-Tepe, and only separated from it by a road, is a high oval table-flat, surrounded by the foundations of an ancient wall. The inhabitants are said to have dug for stones in these foundations at a very recent period.*

A second site is found on the little cape at the S. of Beshika Bay; and a third (Αγαμεια?) near the Beshika-Tepe on the southernmost extremity of the Sigæan ridge.

* This spot was subsequently examined by me, but I could discover no evidence sufficient to convince me that it was an ancient site. The supposed foundations are not built; they are merely long trenches dug under the edge of the flat hill to obtain materials for building from a calcareous stratum which forms its upper layer.—*T. Spratt.*

About the middle of that ridge, close to the N. side of the Agios-Demetrios-Tepe, Mr. Spratt discovered the foundations of an ancient square-blocked city wall, following the edge of the broad table-land.* Here may have been the real site of Sigæum: at Yeni-shehr are no remains whatever of ancient town-walls, and the level on which it stands does not appear extensive enough for the ancient town. I am inclined to believe that when the Turks conquered the country there was still a town where the fragments of a wall have been discovered by Mr. Spratt, and that Yeni-shehr (new-town) was erected near it, after it had been destroyed and deserted. It ought to be mentioned however that there are a great number of deep wells excavated in the rock at Yeni-shehr, and this may be an argument for fixing upon that village as the site of Sigæum.

Broken stones, pieces of brick, and pottery are found in considerable quantity in the vicinity of the tumuli of Achilles and Patroclus. We know from Pliny (v. 30) that the Achilleon was originally built near the tomb of Achilles, and afterwards removed nearer to the sea where his fleet had its station. Possibly Kum-Kaleh may occupy the exact site, and hide all vestiges of the ancient town except some wells of uncertain date.

Where the winter stream of the Bunarbashi-Su joins the Mendere, there are some immense blocks of irregular shape; they may have formed part of the wall of a small fortress.

Stones, bricks, and pottery are found on the hill between the In-Tepe and the In-Tepe-Asmak, and there can be little doubt that they indicate the site of Rhæteum, from which the promontory had its name. Choiseul Gouffier has placed the ruins of Rhæteum at It-Ghelmes, and the ruins of Aphrynium at Aren-Kevi. It-Ghelmes and Aren-Kevi are two names for the same place; and there are no ruins there. The ruins on the brow of the ridge to the W. of It-Ghelmes evidently belong to Aphrynium. The only ruins that can indicate the site of Rhæteum are those situated near the In-Tepe and In-Tepe-Asmak, which had remained unnoticed by all modern travellers until discovered by Mr. Spratt.

Fragments are found near Halil-eli and Dumbrek, but they have all been taken from the ruins of Ilium recens.

The identity of the ruins at Hissarjik with Ilium recens is so generally admitted that I need only state my concurrence in the prevailing opinion. Amongst these extensive ruins, the Acropolis, the theatre, the foundations of a bath, with an aqueduct and the town-wall, may be easily recognised.

* The foundations of a wall fenced with quadrangular blocks of limestone are well defined in three or four places on this hill. On the N. side it is continuous for nearly 100 yards.—*T. Spratt.*

Kum-Kevi has the appearance of an ancient site, though most of the fragments have been brought from Ilium recens.

Upon the Chiblak range, in a line between Hissarjik and the flat mound called Kara-Yur-Tepe, about a mile W. of the latter, we found some fragments of bricks and pottery among stones; and on the Kara-Yur-Tepe there appeared to be the foundations of houses or towers. These probably indicate the site of the Ilian village (Ἰλιέων κῶμος) and Callicolona of Demetrius of Scepsis.

A small valley, in which is a low flat tumulus, separates the site of Ilium recens from the ridge of the Pasha-Tepe. This ridge, though less extensive than that of Hissarjik, seems to present in other respects a more eligible site for a town. The Pasha-Tepe, and two wells at its side, appear to indicate that it has at one time been occupied.

What have been called the ruins at Chiblak are merely a Turkish burying ground, full of fragments from Ilium recens.

Some indications of ancient buildings are found on the hills above the Judan, near Akchi-Kevi. They are extensive, although there is no appearance of a town wall. Near them, and now surrounded by the marshy lake, is a bridge, 20 feet wide, across the channel of the Kalifatli-Asmak. It is evident that the extension of the lake must have rendered this bridge impassable to carriages for many centuries; the stones of the arch are about 1½ foot in thickness; and yet the wheels of carriages have worn not merely deep tracks, but positively large holes through them. It is impossible to assign a date to this bridge, or to any of the bridges of square blocks for foot passengers which are pointed out on the map.

Ruins of ancient buildings are found at Akchi-Kevi, principally in the vicinity of the Kanai-Tepe. Those on the left bank of the Kimar, a little higher up, are probably of more recent date. There are none near the aqueduct.

With the exception of the remains at Kum-Kevi, the large blocks at the ancient mouth of the Bunarbashi-Su, and a few large stones near a well at Kalifatli, there are no remains *in situ* in the plain itself. Of the marble columns near the road from Chiblak to Bunarbashi, to which the drawing of Choiseul Gouffier gives the appearance of a temple, not one is in its original situation: four of them are of granite, and one of marble, and one of the four is inverted.

The most considerable ruins, after those of Ilium recens, are the remains of an Acropolis on the heights of Bunarbashi. The traces of the Acropolis walls are continuous: at the point where an offset of the steep rock advances like a spur into the valley of the Mendere, three layers of square stones may still be seen in their

original position. We did not see the steps which M. Mauduit (in 1811) discovered at the end of this spur, probably because it was covered with earth, for I was subsequently told, upon good authority, that one of the officers of the French squadron had seen it. On the south side of the Acropolis are plainly to be seen foundations of terrace walls rising one above another. A wall of small stones, now covered with earth and grass, but which has evidently been of considerable height and thickness, crosses this high rocky promontory. Inside of this wall is a large hole, surrounded by heaps of earth and stones, indicating an ancient cistern. Outside the wall, at its north-eastern end, is a large pit, which probably also served for a cistern. To the W. of this is a second wall of still greater dimensions, extending likewise across the summit of the hill from one precipice to the other. Indications of buildings can be traced between the two walls. Outside of the second wall are the three tumuli placed in a line from N.W. to S.E. I have already mentioned that there is a large pit in the solid rock near each of them. Beside the fourth tumulus, on the E. end of the ridge, are heaps of stones, apparently remains of houses. A low mound, of which it is difficult to say whether it be natural or artificial, runs along the top of the ridge leading from Bunarbashi up to the three tumuli. There are vestiges of a wall on the edge of one of the lower hills at the side of the Mendere, N. of the Acropolis; and a number of large blocks are seen on the road which leads down to the river at the end of the valley of Arabler from the fourth isolated tumulus. There are many fragments in the village of Bunarbashi and its burying-ground, but none of them in their original sites. At the foot of the ridge, between the village and the Mendere, is a nearly isolated hill, which in winter is surrounded by the inundation. The sources of the Bunarbashi have been frequently described. Some discovery might be made were future travellers to clear out the sand of what is called the warm basin, and to examine whether the modern basin in the spring next to it, now nearly choked up with grass, does not conceal an ancient one.

Having thus endeavoured to convey a distinct and correct notion of the plain of Troy as it at present exists, a few remarks relative to the *Homeric* topography may not be out of place. I begin with the Scamander, for everything depends upon the identifying of that river.

Pliny's brief account of the Troad is important for this purpose. He enumerates the places on the coast in the direction from S. to N. and N.E. After mentioning the town of Nee he proceeds:—"Scamander amnis navigabilis et in promontorio quondam Sigæum oppidum. Dein portus Achæorum in quem

influit Xanthus Simoenti junctus, stagnumque prius faciens Palæscamander." It is clear from this passage, that in the time of Pliny the name of Scamander was given to a stream which discharged itself into the Ægean Sea S. of Sigæum, and which still formed a marsh communicating with the Simois to the N.W. of Sigæum by a branch called Palæscamander (the old Scamander). This statement is applicable to the Bunarbashi-Su, and to no other river of the plain. Eustathius corroborates the statement of Pliny by his etymology of the name of the river; he says, (p. 1197, *ed. Rom.*) "The name of the Scamandrus is derived from σκαμμα and ανδρος, because it was *cut* by the *man* Hercules." The derivation may not be worth much, but it proves the existence of the artificial channel of the Scamander long enough before the time of Eustathius to have admitted of such a legend growing up.

The next point to be ascertained is whether the river called Scamander in the time of Pliny corresponds with the description given by Homer of the river to which he attributes that name. The poet says, that one of the two sources of Scamander "flows with warm water, and smoke is generated from it as from burning fire;" and that the other "flows *in summer* like hail, or cold snow, or the crystal (ice) of water." (Iliad, xxii. 149-52). The constant temperature of all the springs of Bunarbashi is from 63° to 64°; consequently, they are warmer than the air in winter. The vapour arising from the surface of the warmer water will be more observable in the case of the spring which spreads out in a broad basin than in that which steals through a narrow channel choked up with grass. In summer the temperature of the springs is slightly lower than that of the atmosphere; and it is a fact, that the water from the sources at Bunarbashi, which do not spread out, tasted more cool and pleasant in the month of August than the water from the principal spring, which expands into a basin. The popular imagination would be in Homer's time struck with the spring which smoked in winter, and the spring which was cool in summer, and the poet has done no more than graphically expressed the popular impression. He says simply that vapours ascended from the surface of one of the springs, and that the other was very cold "in summer." It may also be remarked, that the word (λιαρῷ) generally translated *warm*, means more frequently *smooth*, and that Homer may have used λιαρῷ ρεει antithetically to προρέει—"flows smoothly" to "bursts forth;" intimating that the smooth-flowing water gave forth vapours, and that the impetuous spring was cool in summer, which is the case. The poet deals with striking appearances, not with scientific facts. It is no objection to his description that the chemist can show it

to be deficient in strict accuracy. But, on the other hand, there must be an *appearance* to warrant what he says, and the Scamander of Homer must present such a phenomenon at its sources as he describes. The Scamander of Pliny—the Bunarbashi-Su of our day—presents this phenomenon. Following the course of the Bunarbashi-Su, we find it corresponds exactly with Homer's description of the Scamander. The low banks of the river (v. 36); the high water overflowing the banks (xxi. 9, 26); the "deep dizzy stream" flowing through the "fruitful plain" (xxi. 602-3); the richly wooded margin (xxi. 352); all are true to nature.

The natural channel by which the waters of the Scamander found their way into the Simois (the modern Mendere) in the time of Homer—the Palæscamander of Pliny—still exists, as may be seen on the map. At certain seasons the Scamander still joins the Simois. After or during heavy rains, when Jupiter sits on Mount Ida, collecting his clouds and throwing his thunder-bolts, Scamander still rises and overflows his banks, calling on his brother Simois to fill his channel from all fountains and torrents, that they may meet on the plain. At such times the water of both rivers becomes yellow, but more especially that of the Scamander, which has a flat bed in the clayey plain; and hence that river received the name Ξανθος (yellow).

If the Bunarbashi-Su is the Scamander, the Mendere must of necessity be the Simois. I trust the description of this river will have convinced the reader that it never has altered its bed. The hypothesis that it now flows in a different bed from what it did formerly, originated in a mistake of Choiseul Gouffier, who supposed the Pasha-Tepe-Asmak to be the Kalifatli-Asmak, and the latter water-course the ancient bed of the Scamander.

This seems the proper place to notice another hypothesis, that in the time of Homer a large bay intervened between the Sigæan and Rhætean promontories. The elevation of the whole slope of the In-Tepe ridge and the deep steep banks of the arms of the Kalifatli-Asmak, in the lower part of the plain, appear to be incompatible with the assumption that such a bay ever existed. The extensive sea-lakes at the bottom of the plain are also, I think, inconsistent with the hypothesis. They are very deep; and it is inconceivable that the plain could be protruded into the Hellespont without their being first filled up. The current of the Hellespont carries off and deposits the sand which the Mendere brings down on the shoal to the left in leaving the Hellespont. This view is corroborated by Sir J. Wilkinson's investigations into the accumulation of soil in the valley of the Nile. The plain of Troy is alluvial, but the alluvium was deposited long before the time of Homer—perhaps before Mount Ida had risen from

the sea.* Lastly, the existence of a bay in former times is entirely unsupported by evidence: it has been gratuitously assumed in order to reconcile the position of the ruins at Hissarjik with the distance from the sea which Strabo assigns to Ilium recens; and the correctness of the distance of 12 stadia, as it is given in the common editions of that geographer, may well be questioned, seeing that in Scylax it is said to be 25.

The Kalifatli-Asmak seems to have most claim to the name of Heptaporos—which means a river with many fords—but this is a mere conjecture.

The Resus, according to Strabo (and Eustathius, p. 889, ed. Rom.), was called Roites (Ροιτης). This being evidently the river next to the promontory of the same name, was most probably the branch which detaches itself from the Dumbrek near Halil-eli.

The Dumbrek river is, I am persuaded, the Thymbrius; for the Turks, who can account for the name of every village in the plain, cannot explain the meaning of Dumbrek and Dumbrek-Kevi.

The Kimar I believe to be the Andreios; and, if I am right in this conjecture, the small river which I have called the Pasha-Tepe-Asmak must be the Karesus.

Piræus, *Nov.* 8, 1839.

* That the effect of rivers in altering the character of the coast at their mouths has been frequently exaggerated may be admitted without going so far in the other extreme as Dr. Forchhammer has done here. After reading his account of the violent alternations of moist and dry, heat and cold, to which the plain of Troy is exposed, it is scarcely possible to conceive that it has remained altogether unaffected by them for the long space of three thousand years. The case of the Nile is not a parallel one to that of the Mendere. The Nile deposits its alluvium all along the broad valley from above Kartum to the sea, and may therefore retain little wherewith to extend the coast-line. But the whole alluvium of the Mendere is deposited between the mouth of the Kimar and the sea. The frosts and thaws, too, to which the plain of Troy is subject, will break up the surface soil, and expose it more to the action of the waters, an element which is not at work on the Lower Nile. The sea-banks of the lagoons at the lower end of the plain of Troy are the same as we find the sea casting up on many coasts at a short distance from the shore: in proportion as the plain was extended into the sea, these banks would be formed further back in the sea; the lake would be pushed out as well as the coast-line. Mr. Spratt has the following note upon this passage:—"The alluvial banks of the In-Tepe-Asmak, near its mouth, are high and steep, and the elevation continues along the shore for a few hundred yards, not terminating abruptly, but inclining gradually from the Asmak to the marshy lagoon, the edge of which is low; evidently indicating that a deep indentation or arm of the sea once entered here, which has not yet been filled to the general level of the plain."—Ed.

III.—*Geographical Account of Albania, extracted from a Manuscript of* Count Karaczay.

Under this name is comprehended that western portion of the Turkish empire in Europe, bounded on the N. by Bosnia and Servia; on the E. by Rum Ili, or rather that portion of Rum Ili which was called Macedonia by the ancients; and on the S. by Epirus; on the W. it is washed by the Ádriatic. It lies between 40° 25′ and 43° N. lat., and between 19° and 21° 20′ E. long.

The Sea-coast of Albania.—The coast-line of Albania, between the Gulf of Cáttaro and Porto Palermo, S. of Cape Linguetta (Turk., Karaburnu), is about 240 miles long, when the windings of the coast are taken into account. The most northern portion, which is under the dominion of Austria, has three good harbours, the Gulf of Cáttaro, and the harbours of Traste and Budua; and its inhabitants are among the best seamen of the Mediterranean. The coast from Antivari to Avlona is not much frequented, partly on account of the want of good harbours and the dangerous navigation, and partly because vessels touching at any place on it are subject to quarantine. The anchorage is for the most part bad, and there is rarely any shelter from the winds and the sea; besides, the inhabitants are shy of strangers. Still this shore has some harbours, and is not in this respect so badly off as the opposite coast of Italy. From Budua to Porto Medua (41° 48′ N. lat.) the sea has a considerable depth close in land, and large vessels find sufficient water at about ½ a mile from shore; but from Porto Medua to Avlona vessels cannot approach nearer than a mile, if they draw 20 feet of water. Near Cape Linguetta, and to the S. of it, the coast is rocky, and deep water is found close to the shore.

The N.E. wind, called Bora, is dreaded, not so much on account of its violence as of the suddenness with which it sets in. The signs which usually foretell its approach are small dark clouds surrounding the summits of the mountains, and moving in different directions; sometimes white clouds of a round form hover over the mountains, and the sea is very low. On the contrary, the scirocco, or scilocco, a south-eastern wind, causes the sea to run extremely high, when, as is commonly the case, it continues to blow three days in succession. Its approach is indicated by black clouds covering the mountains, a higher rise of the sea, and an increased temperature. This wind brings much rain.

The strait dividing Cape Linguetta from Otranto is only about 42 miles wide. The following are the harbours of Albania:—

The Gulf of Cáttaro (Le Bocche di Cáttaro) is a deep inlet

of the sea, surrounded by high mountains. It is nearly 30 miles long, measured along a line which keeps the mid-channel, and consists of three basins connected with one another by straits. The strait at its entrance is called Punta d'Ostro, the second Kambur, and the innermost Bocca de Loretane. The last mentioned is the most narrow, being at its western end 200 feet, and at its eastern only 160 feet wide. The narrowest portion is called Le Catene. The second and third basins form excellent harbours, being protected against all winds by high hills and mountains. The depth of water varies from 15 to 25 fathoms.

The Bay of Traste is divided from the Gulf of Cáttaro by an isthmus about 3 miles across. This isthmus is formed by a ridge of limestone hills, of moderate elevation, in which good marble is found. The bay has safe and good anchorage, and as a harbour is not inferior to Lissa; but the surrounding country is nearly uninhabited.

The harbour of Budua has good anchorage, but is open towards the S., and exposed to the effects of the S.E. wind.

The harbours of Antivari and Val di Noce, near Dulcigno, have not sufficient depth for large vessels, and are not protected from the sea and wind, when it blows from the W.S.W.

Vessels of moderate size can enter the river Boyana, and sail up it for many miles.

Farther S. are two small harbours; one called Porto S. Giovanni di Medua, and the other Lacheka. They are situated N. and S. of the embouchure of the river Drin, and have tolerably good anchorage. Anchorage is also found in the Gulf of Drin, at the custom-house (Dogana), E. of Cape Redoni. There is also safe anchorage both on the N. and S. sides of Cape Redoni.

The harbour of Durazzo is very indifferent, and, properly speaking, only a roadstead. Then follow the small harbours of St. Anastasio, St. Pietro, Arzenta, Cavo de Pali, Cavo de Laki, and Bestova. They have little depth, and admit only small vessels.

The Bay of Avlona is one of the safest ports on this coast. It has three good anchorages. One is near the castle; another in the cove of Dúkathes, which is also known by the name of Porto Ragusano; and the third at the most northern extremity of the island of Sassena, which lies across the entrance of the bay. The roadstead is open and exposed to northern and south-eastern winds.

NORTHERN ALBANIA.—Between the mouth of the river Narenta (N. of 43° N. lat.) and that of the river Boyana (near 41° 50′ N. lat.) an extensive mountain mass comes close to the shores of the Adriatic; and the watershed of this region is so

near the coast that no river above the size of a torrent falls into the sea. The mountain region, of which these masses constitute the western edge, is of considerable extent, and constitutes a detached portion of the Dinarian Alps, connected with the principal range by a chain which, between 19° and 19° 10′ E. long. and near 42° 40′ N. lat., runs to the E. Near the town of Nixitshi it is of moderate height; but farther E. it rises considerably in the vicinity of Mount Silievatz. At this point it also changes its direction, and turns towards the N., joining the principal chain of the Dinarian Alps at Mount Javor, between the sources of the rivers Narenta and Moratsha (near 43° N. lat.). The northern part of the mountain region, which is thus connected with the Dinarian Alps, like other mountain regions consisting of limestone rocks, forms in several places drainage-basins which have no outlet. Such a basin is that of Lake Krupatz, which receives by the river Matizza all the waters collected in the extensive depression in the middle of which the town of Nixitshi is built; and the still larger basin of the river Trebinstizza, which extends nearly 30 miles in length, generally parallel to the Adriatic. This part of the mountain region, however, does not belong to Albania, but lies within the Turkish province of Herzegovina.

The largest, and at the same time the most elevated, portion of the mountain region lies within Albania, and is called by the natives Zernagora (pronounced Chernagora); by the Turks, Karatagh; and the Italians, Monte Negro; all which names signify Black Mountains: and this designation is derived from the forests which formerly covered the whole of the country, and still cover a part of it. The plateau is widest at its northern border, between 42° 30′ and 42° 40′, where it extends from W. to E. upwards of 25 miles, its western edge rising immediately from the sea, whilst its eastern border is only from 1 to 3 miles distant from the western banks of the rivers Moratsha and Zenta. The range of the eastern border is nearly due N. and S., from 19° 15′ E. long., to where it meets the Lake of Skutari. S. of this point the mountain region is limited to the tract dividing the lake and the valley of the river Boyana from the sea; and here it is scarcely 8 miles wide. N. of the lake it is widened, in consequence of the shores of the Adriatic trending from S.E. to N.W.

The most elevated part of the Zernagora lies to the N. of the parallel of the northern extremity of the Lake of Skutari, between 42° 10′ and 42° 40′ N. lat. Its declivity towards the sea and the bays of Cáttaro and Traste is steep, and in some places nearly perpendicular; and the mountain masses, at a short distance from the sea, reach a considerable elevation, upwards of 1000 feet. With the exception of their base, which is wooded in many parts,

these declivities are quite bare of vegetation, the steepness of the rocks preventing the accumulation of earthy matter. The interior of the mountain region is a table-land, elevated probably more than 2000 feet above the sea-level; the surface of which is divided by short ridges, running in every direction, and forming a considerable number of small depressions, which take the form of valleys, but are rarely more than 3 or 4 miles long, or more than a mile wide. There are depressions in all these ridges, which afford the means of passing from one valley to another. This peculiar surface, combined with the absorbent nature of the limestone rocks, prevents the accumulation of water into rivulets and streams. Even wells are extremely rare. The inhabitants are, therefore, obliged to collect rain water in cisterns for their household use and their cattle. The woods are mostly composed of oak and beech. On the ridges they are stunted; but in the depressions they attain a considerable size. In these forests the *Rhus cotinus*, or Venus sumach, abounds; a shrub whose wood is used in dyeing and tanning. Large quantities of it are annually brought from the mountains to Cáttaro, whence it is exported to Trieste and Marseille. The places which are not wooded are covered with a rather thick turf, interspersed with several aromatic plants, as savory, thyme, juniper, &c.

On the table-land a few mountain masses rise considerably above the general level. Near the sea are:—Mount Vegli Verch, N. of the town of Risano, which is built at the termination of the northern branch of the Gulf of Cáttaro; and Mount Lovtshin, or Monte Sella, at the northern base of which stands the town of Cáttaro. But the highest summits are found in the interior of the plateau: they are, taking them in succession, from N. to S., Mount Pusti Lissaz, M. Stavor, Doberstik, Zeklinsta, and Virayl. Their sides are not precipitous, but their summits are 5000 feet, or even more, above the sea-level.

Near its eastern edge the general level of the table-land becomes somewhat lower, and sinks into the low and level country which extends along the river Moratsha, by successive depressions terminating in gorges. These gorges, however, are very narrow, and easily defended against an invading enemy. A few inconsiderable streams issue from them, and fall into the river Moratsha or the Lake of Skutari. Proceeding from N. to S., the most important of these rivulets are,—the Orealuk, draining a fertile and populous valley of the same name; the Sussitza, which rises on the eastern declivity of Mount Garatsh, one of the high summits of the Zernagora; the Siniatz; and the Zernoyevish.

Owing to the height of the table-land above the surface of the sea, great part of the Zernagora is an inclement country, with a long winter, and much cold weather in autumn and spring. This, to-

gether with the rocky soil and want of water, renders agriculture precarious and of limited extent. Indian corn and potatoes are grown, and several kinds of vegetables, especially cabbages. The inhabitants live principally on the produce of their flocks of sheep and goats: cattle and horses are scarce, but hogs are more numerous. As the inhabitants are excluded from the bazaars of the Turkish towns near the mountain region, they dispose of their surplus produce, their smoked mutton (called castratina), sheep-skins and coarse wool, cheese, tallow, bacon, bees'-wax, and live stock, to the inhabitants of Cáttaro. They also carry firewood and the Venus sumach to that town, and take back a little wine and spirits, salt, oil, iron, and some manufactured articles, especially arms and gunpowder.

There are no artificial roads in the Zernagora, and the inhabitants do not make them, lest they should give facilities to invaders. The paths which connect the hamlets or small villages with each other are in general impracticable for beasts of burden. Even the line of communication along which the internal commerce of the country is carried on, which leads from Cáttaro to Zettinie, the residence of the Vladika, or spiritual governor of the republic of Montenegro, is in this condition, and the two lines which connect the valley of the river Zenta with Cáttaro. The more southern road of the two last mentioned runs along the course of the river Sussitza to a small village called Gerlishi; then passes through a narrow gorge to a funnel-shaped depression of the plateau, called Yednoss, in which is the village of Miogost; and thence westward through a chain of depressions, till it meets the northern road at Resna. The northern road leaves the valley of the river Zenta at Stubizza, and passes through Cerovo and Oranide in a southern direction to Resna. From Resna the road continues southward to Niegussi, whence it runs westward to Cáttaro. In many places these paths are so bad that the goods must be carried on the backs of men.

The portion of the mountain region of Zernagora which lies S. of a line drawn from the town of Budua, on the Adriatic, to the northern extremity of the Lake of Skutari, contains a single range of mountains, which, with its offsets, fills up the whole space between the lake and the sea. The higher part of the range may be about 3000 feet above the sea-level, and a few of its summits rise still higher, as for example, Mount Shaptina, near the point where the territories of the republic of Montenegro and the Austrian and Turkish empires meet; Mount Rumia, farther S.; and Mount Mossura, a few miles N. of Dulcigno. This range has less precipitous declivities than the hills farther N., and they are frequently broken by ravines and watercourses forming small valleys, and terminating, at least in the vicinity of the Lake

of Skutari, in level tracts of small extent. The higher portion of the range is partly wooded, especially on the side next the lake. The lower declivities, with the valleys, present considerable tracts fit for agricultural purposes. The country surrounding Mount Rumia is only fit for pasturage, and is inhabited by herdsmen possessing large flocks of sheep. In this mountain tract much corn, particularly maize, is grown. There are also large vineyards and orchards, yielding every kind of fruit of excellent quality, such as peaches and quinces. Vegetables of every kind are cultivated—potatoes, cauliflowers, cabbages, and turnips, as also melons, of which some are of excellent flavour, and the *Mamordica balsamica,* or balsam apple. This portion of the Zernagora gives rise to two small rivers, the Grabovlian and the Zernitza, which fall into the Lake of Skutari: some small streams join the river Boyana. There are no wild beasts of great size in these mountains; but there are considerable numbers of hares, squirrels, partridges, and snipes. The turtle is found in some places.

The mountain region of the Zernagora, with the exception of the portion S. of 42° 10′, which forms part of the Turkish empire, and of the province of Cáttaro, on the coast of the Adriatic, which is under the dominion of Austria, is the territory of the republic of Montenegro. The inhabitants, called by the Italians Montenigrini, and in their own language Zernagorzi, submitted to the Turks, when that nation towards the middle of the fifteenth century extended their conquests to this part of the European continent. The conquerors, however, were unable to establish their military colonies in the mountain defiles, and contented themselves with imposing on the inhabitants a small tribute, and leaving them to govern themselves by their own laws.

In 1712, when the Zernagorzi took up arms in favour of Peter the Great, they defeated a numerous Turkish army near Mount Vrana, and since that time the most inaccessible part of the country, the Nahia (*canton*) Katunska, has considered itself quite independent. Since the defeat of the Turks near Mount Russovnik, in 1796, the inhabitants of the more southern districts have joined the inhabitants of the Katunska Nahia, and submitted to the sway of the Vladika. These districts now form the nahias of Rietshka, Zermnitshka, and Lieshanska; and the united cantons constitute the republic of Montenegro. Their population amounts to about 56,000 individuals, of whom 25,000 are in the Nahia of Katunska, 12,000 in that of Rietshka, 13,000 in N. Zermnitshka, and 6000 in N. Lieshanska. Some other tribes, which are allied to the confederation, will be noticed hereafter.

At the eastern base of the Zernagora is a valley, drained by the river Zenta and by the lower course of the Moratsha. The

Zenta, or, as it is called by the natives, Zetta, rises on the southern declivity of the lower portion of the mountain range which connects the Zernagora with the Dinarian Alps. Three small rivers, descending from the mountains, unite at their base, near the village of Drenoshtiza, and form the river, which runs at first through a narrow valley nowhere a mile in width, until it reaches the village of Frutak, where the valley opens, and may be, on an average, nearly 2 miles across. Near the small Turkish fortress of Spuss the mountains again come close to the river on both banks, so as to form a gorge, in which there is scarcely room for a narrow road. After emerging from this defile the river flows in a valley about 5 miles broad, till it falls into the river Moratsha, coming from the N.E.

Though the valley of the Zenta is not wide, the declivities of the adjacent mountains, being gentle and susceptible of tillage, are cultivated in many places to a distance of nearly 3 miles on each side of the river. A good deal of maize is grown; but the flocks of sheep and goats constitute the principal riches of the inhabitants, and supply them with food and articles of barter. The mountain slopes are wooded with oak, elm, and acacias; and the *Rhus cotinus* abounds.

The valley of the Zenta is inhabited by a tribe of Albanians, called Bielopovlitshi, who were formerly subject to the Turks, but who joined the confederation of the Zernagorzi, as allies, about the beginning of the present century, and form a canton of their republic; which, however, is not called Nahia, but Berda. The population of this tract is estimated at 15,000 individuals.

Mount Silievatz is situated where the ridge which connects the Zernagora with the Dinarian Alps turns north. Its height is considerable. This ridge joins the principal range at Mount Javor. From Mount Javor the Dinarian Alps run E.S.E. to Mount Rovtzi, near 42° 50′ N. lat., where they turn southward, and continue in that direction (for about 15 miles) to 42° 35′. and then turn again to the E. They retain this easterly direction to Mount Troizza, a distance of about 30 miles, and then they run, for upwards of 10 miles, to the E. of N., to an elevated summit called Dobrobuk-Planina. Hence, between Mount Rovtzi and Mount Dobrobuk-Planina, the great chain forms nearly a semicircle, and does not extend, as is erroneously represented in our maps, in a straight line between these summits. The river which issues from the Lake of Plava, and is made in the maps to join the Zievna, an affluent of the Moratsha, really runs to the N., and after forcing its way through another, less elevated, mountain range, joins the Lim, an affluent of the Danube. This northern range, which from one of its elevated summits may be called the range of Mount Visitor, and which has its continuity broken by the gorge,

through which the river of Plava finds its way northward, extends nearly due W. and E., between Mount Rovtzi and Mount Dobrobuk-Planina. The country which is enclosed by the range of Mount Visitor and the principal chain of the Dinarian Alps, belongs to Albania, and is known by the name of the Plain of Plava. Its surface is rather hilly than mountainous, and it contains a considerable portion of fertile land, but the difficulty of bringing the agricultural produce to market precludes the extension of tillage beyond what is required for the consumption of the inhabitants They export, however, the produce of their herds and flocks (hides, wool, and cheese), and a considerable quantity of wax, to the towns of Servia, especially to Sienizza and Yenibazar. This district is rather populous, containing 23 large villages, of from 30 to 100 houses, and a population which is estimated at between 6000 and 7000 individuals, and which has probably much increased since that estimate was made. The inhabitants are Catholics. They do not pay any tribute to the Turks, but are bound to maintain a certain number of sipahis.

To return to the Dinarian Alps: where this great chain, S. of Mount Rovtzi, makes a bend to the S., rises one of its most elevated and extensive mountain masses, Mount Kom, the summit of which is covered with snow during great part of the year. The base of the mountain extends 6 or 7 miles from W. to E.; it terminates in two peaks, which are steep and inaccessible, and are, according to estimate, between 8500 and 9000 feet above the sea. In the upper regions of the mountain only a few stunted trees are found; but about 4000 feet above the sea-level there are large forests of pine and fir. The pasture-grounds are indifferent, and only fit for goats. On the eastern declivity of Mount Kom is a small lake, called Rikawetz, which has no issue. At some distance to the S. is a much lower mountain, called Mount Koritts. W. of Mount Kom is a mountainous and broken country, which extends beyond the river Moratsha and joins another mountain range coming from Mount Silievatz. This range terminates in high hills, N. and E. of the Turkish fortress of Spuss: it is called the mountain of Polievizza, and is nearly 5000 feet above the level of the sea. The western declivity (towards the Zenta river) is frequently precipitous, but in some places it descends by a gentle slope. The country E. of the mountains of Polievizza, as far as Mount Kom, is a high table-land, with a very rugged surface. The river Moratsha nearly bisects it: this river has its rise on the southern declivity of the Dinarian Alps, near the elevated summits of Mount Dormitor and Mount Lukavitza, not far from the sources of the river Narenta, which falls into the Adriatic, and those of the Tara, one of the principal affluents of the river Drina, which runs to the Danube.

The high mountains which surround the upper course of the Moratsha are inhabited by a small tribe of Albanese mountaineers called Uskotzi. The valley in which the river flows is very narrow as far as Ritshani—properly speaking, it is a mere glen, and must have a great elevation above the sea-level, for the temperature is in general very low, and nothing thrives but oats and potatoes, except in a few sheltered places, where a little wheat is grown. Common fruit-trees grow, but their produce is of indifferent quality. The mountains, however, have good sheep-walks, and the inhabitants live chiefly on the produce of their flocks. The forests, which extend over a considerable portion of the district, consist chiefly of oak, ash, and elm. A clayey earth, from which the inhabitants collect small garnets, is found in the valley. Near Ritshani the Moratsha is joined from the E. by a small river called Mala-rieka, which brings down the waters collected on the western declivities of Mount Rovtzi and Mount Kom. Below the point where it receives this stream the Moratsha runs southward, gradually declining to the S.W., till it enters the Plain of Skutari, a few miles N. of Podgorizza, and is soon afterwards joined by the river Zenta. The middle valley of the Moratsha is much wider than the upper valley; the hills recede to a greater distance, especially on the E., but the level tract along the banks is very low, and in many places swampy. The soil is much more fertile, and the climate less severe. Cultivation is carried on to a greater extent, and maize yields rich crops. There are no forests, but numerous small groups of oak and elm, mixed with juniper-trees, the sorbus domestica, apple and pear trees in a wild state, and elder-trees. Vines do not thrive, nor are almond-trees or fig-trees found in the valley. Though the inhabitants of the valley derive some advantage from the trees, and still more from their cultivated fields, they rely for their principal subsistence on the produce of their herds and flocks; sheep and goats being very numerous here, as is the case all over the mountainous parts of Albania.

The valley of the Moratsha, above Podgorizza, and the mountain tract to the W. and E., are inhabited by five tribes of Albanese mountaineers: next to the sources of the river are the Uskotzi; and near them the Moratshi; somewhat lower down the Rovtzi. These three small tribes, amounting to about 10,000 souls, are united into one political body, called the Berda Moratshka and Rovatzka; they are allies of Zernagorzi, and quite independent of the Turks. They joined the confederation since, the beginning of the present century. The country S. of Ritshani is divided between two other tribes of mountaineers, the Piperi and the Kutshi; the former living on the W., and the latter on the E. side of the river Moratsha. Each tribe forms a separate political

body, connected with the confederation of Montenegro; the first is called Berda Piperska, and the second Berda Kutshka. The population of the Piperi is estimated at 9000, and that of the Kutshi at 17,000 souls: the latter estimate, however, is evidently too great. The Kutshi did not join the union till 1831.

The inhabitants of the four berdas (Bielopovlitshka, Piperska, Kutshka, and Moratshka) are distinguished in the confederation of the Montenigrini by the name of Berdiani; whilst those of the Zernagora are called Zernagorzi. The whole population of these countries adheres to the tenets of the Greek church, and consequently submits without reluctance to the directions of the Vladika, or Greek bishop, residing at Zettinie, who unites the supreme political and ecclesiastical power in his person.

The river Zievna, called by the Turks Sim-su, flows from Mount Troizza westward, along the base of the principal chain; passes the southern prolongation of the range of Mount Kom, at no great distance from Mount Kakaritska, the most southern summit of that range; enters the Plain of Skutari near Dinossi; and joins the Moratsha near Gerlic, 10 miles from that town, and about 5 miles below Podgorizza.

The valley of this river is in general narrow, but at some points it widens so as to admit of cultivation. This has enabled the Turks to form several establishments in it, of which the most important is Seliste. As the country to the W. is inhabited exclusively by independent tribes, the road traversing the valley of the river Zievna is the most western line of communication between the Turkish provinces which are situated S. and N. of the great chain of the Dinarian Alps. This road crosses the range a few miles E. of Seliste, near Mount Musishi, and leads to Gusinie, in the Plain of Plava. To secure this pass, and protect travellers against the depredations of the predatory tribes inhabiting the neighbouring mountains, the Turks have built a fortress, called by the inhabitants of the district Castelli-novi, in which a garrison of 500 men is kept. The number of houses within and around this fortress is about 500.

Another chain of mountains, which bounds the valley of the Zievna on the S., may be called, from the tribes which inhabit it, the mountains of the Climenti and Hotti. They are lower than the principal chain, but sufficiently high to deserve the name of mountains. Few summits rise above the level of the group; the highest is Mount Veletsiko. This chain is several miles in width, and terminates on the W., about 10 miles from the banks of the river Moratsha, S.E. of Dinossi. The Climenti and Hotti live exclusively on the produce of their sheep and goats; they pay no tribute to the Turks, but have not joined the confederation of the Zernagorzi, as they are strict adherents to the Roman Catholic

creed, and averse to submit to the orders of a Greek bishop. The Climenti, who inhabit the mountains near Mount Troizza and the mountain-pass of Castelli-novi, are said to consist at present only of about 3000 individuals: the greater part of the tribe emigrated along with the bishop of Ipek, during the last century, to Hungary, where they settled, and are still known under the name of Climentini. The Hotti, who occupy the mountains S. of Seliste, are said to be 4000 in number.

From the southern side of the mountains of the Climenti and Hotti extensive mountain masses branch off towards the S., which fill up by far the greatest part of the space intervening between that range and the valley of the Drin. These mountain masses advance so close to the banks of the river that in most places there is not level ground enough for a road, and the line of communication from Skutari to the towns of Jacova and Prisrend leads over the hills which extend along the river. The mountains which cover the greatest portion of this country are in some places of considerable height, and form large masses; but they have the appearance of being isolated, for they are connected with the range of Climenti and Hotti only by low ridges. Such isolated mountain masses are Mount Narmaya in the centre, and Mount Zukal in the western districts. The sides of these mountains are covered with timber-trees: the depressions and valleys between them are drained by three rivers, one an affluent of the Boyana, and two affluents of the Drin. They are called (from W. to E.) Drinoss or Khiri, Shalla, and Marturi. The tract of this mountain region, contiguous to the mountains of the Climenti and Hotti, contains a very small portion of land fit for agricultural purposes; and its inhabitants depend for food and clothing upon their flocks of sheep and goats. They belong to two tribes of mountaineers, called Shalla and Shossi; are Roman Catholics, and independent of the Turks. The population of each tribe is stated to amount to about 1200 individuals. The four independent tribes—the Climenti, Hotti, Shalla, and Shossi—are comprehended under the general name of Malasori (the inhabitants of the Four Mountains). They are very warlike, and extremely skilful in the use of their arms. The southern part of this region, adjoining the river Drin, contains a greater quantity of level ground between the mountain masses, and consequently agriculture is more attended to. The bulk of the population in this region is composed of Albanese, of the Roman Catholic creed. They pay an annual tribute to the Turkish government; to collect which *balimbashi*, or collectors, reside among them, who are sometimes called upon to settle disputes which their hereditary chiefs are unable to decide. In ordinary cases the chiefs pronounce judgment according to rules established by custom.

The Plain of Metoja lies E. of this region; and that of Skutari

joins it on the W. The Plain of Metoja is contiguous to the principal chain of mountains. From the summit of the Dobrobuk-Planina this chain extends S.E.—its direction being indicated by the summits called Peklin, Hajla, Glieb, and Golish—until it meets the large mountain-knot called Sharra Tagh; it extends between 42° 10′ and 42° 20′ N. lat., and between 20° 50′ and 21° E. long. From this mountain-knot the two great mountain ranges, called Mount Balkan and Mount Pindus, branch off to the E. and to the S.; the former terminating on the shores of the Black Sea, and the latter in the Peninsula of Morea. The range which separates the basin of the Ak-Drin from the rivers falling into the Danube is very high, rocky, and wooded, as far as Mount Glieb, but between this summit and the Sharra Tagh it sinks so low that, when seen from a distance, no mountain range appears to intervene between the Plain of Metoja and that of Kossovo Polie, of which the town of Pristina is the capital, and which is drained by the rivers Ibar and Sitnizza, affluents of the Danube. The Sharra Tagh rises to such an elevation that its summits are covered with snow nearly all the year round.

Along the base of this range runs the river Ak Drin, which rises on the declivities of Mount Dobrobuk-Planina, and Mount Baba, a mountain which rises between that summit and Mount Troizza. The upper course of the river lies among the mountains which cover the country between Mount Troizza and Mount Hajla. The valley of the river is here very narrow, but it widens considerably in the vicinity of Ipek, and from that place to the district of Prisrend the country on both sides of the river is an undulating plain several miles in breadth. This is a very fertile tract of country, abounding in many kinds of grain and fruits; but those of the southern countries of Europe and vines do not thrive, which shows that the plain of Metoja must be considerably elevated above the sea. The valleys which open into this plain are partly wooded, but large tracts in them are cleared and well cultivated, especially those on the west of the river, which are drained by the Bistrizza and Ervenik. The bulk of the population of this country consists of Albanese professing the Catholic creed; but a great number of Turks are settled among them. The Christian inhabitants are called Gheghusheni, or Ghegues. They are a very industrious people, cultivating the ground with care, and manufacturing guns of good quality.

Below the mouth of the river Topolavha the Ak Drin turns to the S.E., and descends from the plain through the Val Salki, which is narrow in the upper part, but widens as it approaches the Kara Drin into a small plain, that takes its name from the village of Brut, built nearly in the middle of it. In this plain the Ak Drin unites with the Kara (Black) Drin.

The Plain of Skutari, formerly called Zenta, is, properly speak-

ing, only the lower and wider portion of the valley of the Moratsha, or rather the continuation of that of the Zenta River. At its southern extremity is the Lake of Skutari, which extends from N.W. to S.E. upwards of 20 miles, its average width being 5 miles, though at some places it increases to nearly 7. From the north-eastern side of the lake an arm branches off, which extends about 5 miles inland, but does not much exceed 1 mile in breadth where widest. There are several islands in the lake, of which five are inhabited—SS. Nicolo de Uranina, Oscagorizza, Stavernagorizza, Morakovish, and Gorizza. The lake abounds in fish, especially salmon and the *scoranzo.* The latter is called by the natives *uklieva;* it is about the size of a herring, and enters the lake in autumn from the river Boyana: it is then found in astonishing numbers. There are places in the lake which have a smooth bottom, and present besides the appearance of springs issuing from the earth. These places, called *oko,* are visited by the scoranzi when the weather becomes cold, because the temperature of the springs is more elevated than that of the water of the lake: their number is then so great at these places, that an oar pushed into the water remains fixed. The *oko* are the property of a few individuals, chiefly Turks, and are, at the beginning of the cold season, surrounded with nets, in which an incredible quantity of fish is taken: they are dried, and form a considerable article of commerce. Trouts are plentiful, and sometimes weigh 50 or 60 lbs. The lake is also frequented by water-fowl: a kind of diver, called smergo in Italian, is trained to assist the fishermen in taking the scoranzi.

The Plain of Skutari extends along the eastern shores of the lake, and farther N. along the Moratsha River, as far as the confluence of the Zenta. The average width of the plain is 5 or 6 miles to the N. of the north-eastern arm of the lake: more to the S. it becomes much narrower. It is the most fertile soil in Albania; studded with villages and cultivated with great care, and interspersed with extensive tracts of forest ground and orchards. This plain produces all kinds of grain cultivated in Italy, with the exception of rice, and every kind of fruit met with in the southern countries of Europe. The meadows and pastures are excellent. The number of Turks settled in this district is much greater in proportion to its extent than in any other part of Albania. The forests, which consist of full-grown fine timber-trees, afford refuge to wild cattle, bears, wild hogs, deer of different kinds, mountain-goats (Capra ibex), lynxes, wild cats, and foxes; there are a very few wolves. Fish is abundant in the river Moratsha, and a Turk has established a very extensive fishery at the village of Momisichi, opposite the town of Podgorizza. The whole plain is frequently called Zenta: the portion which lies on the right side of the river

is distinguished by the name of Liesko-polie, that on the left is called Zetczka-polie.

The valley of the Boyana may be considered as the continuation of that of the Zenta. This river is the channel by which the Lake of Skutari discharges its waters into the Adriatic. Issuing from the lake at its south-eastern extremity, it flows southward, and after a course of about 20 miles enters the sea, forming at its mouth, where it is 400 fathoms broad, a harbour for small vessels. The Boyana is navigable for boats from the sea to the town of Skutari, and coasting-vessels of moderate size can ascend it as far up as the village of Hobotti, about 15 miles from its mouth, where there are some warehouses and a custom-house. The valley through which the river runs is hardly inferior in fertility and cultivation to the Zenta, but it is much narrower, being little more than 2 miles across, except towards the embouchure of the river, where it widens to double that extent. The banks of the Boyana are marshy, and at two places it enlarges so as to form a small lake.

CENTRAL ALBANIA.—The central part of Albania, or that which lies S. of the river Drin, and extends to the ridge terminating at Cape Redoni, is not less mountainous than the northern portion hitherto described, but differs from it in this respect, that the most mountainous parts are found in the interior, whilst the more level districts extend along the shores of the Adriatic. The great chain, which stretches southward from the mountain-knot of Sharra Tagh, has no general name in the country, the designations Mount Vetzi, Magnani, Petrin, Spiridion, and others applying only to single summits, or at the most to some small portion of the range. The ancient name of Pindus is therefore retained to designate the whole range. The information contained in the Count's manuscript respecting this range is very scanty, on account, as he observes, of its being rarely traversed by any travellers except Turks; but the mountains are said to attain such an elevation in many places as to be covered with snow for the greater part of the year. Another chain, scarcely less elevated, runs parallel to the principal range, with which it is connected by a transverse ridge, which bounds the Lake of Ochrida on the S. and E. This lake is nearly 20 miles long, and on an average about 4 miles wide. The mountains surrounding it on all sides slope down to its shores with a gentle declivity, so as to admit of cultivation. The country being sheltered on all sides from the winds, its climate is rather more temperate than that which prevails in other parts of Albania, and vines, and even the more delicate fruit-trees of southern Europe, thrive tolerably well, though it is certain that its elevation above the sea must be considerable, as the current of the river Drin is rather rapid throughout its course, which

probably exceeds 200 miles. The Black Drin, or Kara Drin-su issues from the northern extremity of the Lake of Ochrida, and runs northward for nearly 70 miles (41° 10′ to 42° 10′). In the Plain of Brut it is met by the Ak Drin-su, or White Drin: at the place of confluence the united waters turn to the W. The Drin flows more than 80 miles in this direction, forming, however, a large semicircular bend towards the N. About 20 miles from its mouth it declines gradually to the S., and reaches the sea below Alessio. The distances are here given in straight lines. If the smaller bends of the river are included, its course probably exceeds 200 miles. The Drin attains its maximum breadth of 400 fathoms near Alessio; at its mouth it is only 160 fathoms broad.

The valley of the Kara Drin is confined: on each side the offsets of the mountain masses advance to a short distance from the banks of the river, and leave but narrow level tracts along the river; these only are fit for tillage, for the declivities of the mountains are in general too steep to be cultivated: they are, however, well wooded, and afford good pasture-grounds. The inhabitants of this valley are for the most part Albanese of the Catholic church, called Ghegues, and subject to the Turks.

The chain of mountains W. of the valley of the Kara Drin occupies a base 10 or 12 miles, or even more, in width, and several of its summits are covered with snow for six or eight months. The most elevated of these summits (from S. to N.) are Mount Spileon, Mount Konaj, Mount Shintit, and Mount Moniglia. Two pretty lofty ridges branch off from the western side of this range, and extend to the vicinity of the Adriatic, where they terminate in hills, sometimes close to the shore, sometimes at such a distance from the coast as to leave a level tract along the sea. The most northern of these lateral chains, which branches off near Mount Moniglia, is called by some the Kerubi Mountains: it extends along the southern banks of the Drin, where this river runs from E. to W., and its declivities advance so close to the banks of the river, that there is not sufficient space left for a road; the path therefore passes over the ridge itself, near two elevated summits, called Purk and Tomjon, which rise upwards of 200 feet above the sea-level. This ridge terminates on the banks of the Drin; but considerable mountain masses advance to the S., from where it terminates, as far as the Fandi, an affluent of the Matt River. Mount Kreska, Mount Lais, Mount Veglia, and some other summits of these masses attain a considerable elevation. The high hills terminate at a distance of several miles from the sea.

The southern lateral chain leaves the western parallel range at Mount Spileon, and runs nearly W. as far as the meridian of

Croya, and so far it is sufficiently elevated to deserve the name of a mountain-ridge. Farther W. it declines to the N., and sinks down to hills, which extend close to the shore of the Adriatic, terminating in Cape Redoni. These hills are well wooded, and afford good pastures, but the higher portion of the ridge is stony and barren.

The two ridges of mountains just mentioned are, where they branch off from their principal range, more than 30 miles distant from each other, but at their termination the space between them is scarcely 10 miles wide. The country which they enclose is traversed by ridges of less extent and elevation, which follow the same direction, but sink down to hills at a distance of about 10 miles from the sea, and leave a level plain between it and their extremities, which may be on an average 5 miles wide. These secondary ridges contain valleys of moderate width, which are drained by five rivers, four of which unite into one before they reach the sea, and enter it under the name of the Matt River; its mouth is nearly at an equal distance from the embouchure of the river Drin and from Cape Redoni. The confluents which form this river are (from N. to S.) Great Fandi, Little Fandi, Oracha, and Matt. The fifth river, called Hismo, or Ismo, falls into the bay immediately N. of Cape Redoni.

The valleys drained by these rivers are very narrow towards their sources, but expand as they approach the W. The upper valleys have a cold climate; the inhabitants cultivate a little grain and some vegetables, but depend chiefly on their cattle, sheep, and goats for subsistence. Lower down maize is rather extensively grown, and at several places there are vineyards; orchards are frequent; peaches and quinces are abundant and of good quality. But even here the inhabitants rely for their food, in a great measure, on their flocks of sheep and goats: they have, however, also cattle, horses, and mules. Game too is abundant; a part of the adjacent ridges being clothed with wood.

These valleys are inhabited by two tribes of Albanese, the Miriditi and the Madiani: the former are Catholic Christians, and the latter Mohammedans. The Miriditi inhabit the valleys of the two rivers called Fandi, and form a population exceeding 18,000. They acknowledge the padishah as their sovereign, but are governed by their native princes, the Prenk-Lesci, who assert that they are the descendants of the famous Scanderbegh. These princes reside at Orossi, a small place, inhabited by about 700 persons: they visit annually the principal villages subject to their sway, where they hold courts of justice and decide all kinds of disputes, but do not inflict the punishment of death. The tribute which they pay to the Sultan does not exceed 15 paras for every inhabited house.

The Madiani inhabit the country on both sides of the river Matt and the adjacent mountains and hills. Very little is known of them; their number is said not to exceed 6000. They do not suffer Christians to settle among them, and if a Christian has some business to transact in their country, he must be accompanied by one of the Madiani. They are in a state of permanent insurrection. The Miriditi and Madiani are not immediate neighbours; there is between them, on the banks of the river Oracha, a population of Catholic Christians in a district called Ksella, consisting of about 2000 individuals.

SOUTHERN ALBANIA.—The part of Albania between Cape Redoni and Cape Linguetta is not less mountainous in the interior than the central and northern portions, but has a large plain on the shores of the Adriatic, which extends along the coast from the mouth of the river Uskomobin to the neighbourhood of Avlona, and nearly 10 miles inland. The most extensive of the mountain-ranges by which this district is traversed is called Kandavi: it branches off from the Pindus range near 40° 30′ N. lat., and runs in a north-western direction between the upper course of the rivers Uskomobin and Chervesta, but turns more to the W. after passing N. of 41° N. lat. Mount Tomoros, which separates the basin of the river Chervesta from that of the Voyussa, and which runs due W., is only a branch of Mount Kandavi, and diverges from it near the place where that range quits the Pindus Mountains. Mount Tomoros, however, forms large and elevated masses, which descend with great steepness on the Voyussa, between the towns of Klissura and of Depedelen. The most southern range of mountains in Albania is that which terminates at Cape Linguetta, and is known by the name of Khimera: it is connected with the Pindus Mountains near 40° N. lat., and is of great width, covering an extensive country between 39° 50′ and 40° 20′ N. lat. It rises to a great elevation, and was known to the ancients under the name of Acroceraunian Mountains.

The most remarkable rivers in this part of Albania are the Uskomobin, or Scombi, the Chervesta, and the Voyussa. The Uskomobin rises in the Pindus Mountains, and E. of the Lake of Ochrida, in an alpine lake, and encircles nearly by its curved course the lake on the S. and W. In the parallel of the northern extremity of the lake it turns to run W.: it falls into the Adriatic a few miles below Peklin. The Chervesta River rises in the country where Mount Tomoros branches off from the Kandavi Mountains, and flowing nearly due W., passes near the town of Arnaud Berat, and enters the sea not far from the Lake of Trebuki. The Turks call this river Semene. The Voyussa originates on the western declivity of Mount Mezzovo in the Pindus range, and flows for

more than half its course through a narrow valley, but after passing Depedelen it runs with a rather gentle current through a lower country, and near the sea through a plain. In summer this river is frequently without water. The Turks call it Vussa.

The southern portion of Albania is inhabited by Mohammedans or by Christians of the Greek creed: there are no Roman Catholics. To this circumstance must be ascribed the want of more detailed information in Count Karakczay's manuscript; as that which he has collected on the northern and central districts of Albania was derived, in a great measure, from the accounts of the resident Catholic clergy. The scanty information which he obtained from travellers is embodied in his account of the political divisions of the country, and in that of the principal roads which traverse it.

TURKISH POLITICAL DIVISIONS OF ALBANIA.—The political division of the Turkish provinces is subjected to greater and more frequent changes than that of other countries. Before the rebellion of Ali Pasha of Janina, the southern districts of Albania were united to the vizirat of Epirus, or Toskria, and the remainder formed the vizirat or ejalet of Skutari. After some minor changes, this vizirat was in 1837 abolished, and the country placed immediately under the vizir of Rum-Ili; but in 1838 it was re-established, though some portions were dismembered from it. The subdivisions into pashaliks, or sanjaks, and into kadiliks, are less subject to change; and of these divisions Count Karakczay has given an account.

I. The sanjak or pashalik of Skutari extends over the northern parts of Albania, and advances southward to the vicinity of Cape Redoni, but it does not reach inland to the great chain of the Dinarian Alps and Mount Sharra Tagh. This sanjak is divided into six kadiliks:—

1. The kadilik of Kara-tagh comprehends the countries which constitute at present the republic of Montenegro. The Turkish government has never acknowledged the independence of this country, but looks on it as a province in a state of rebellion, and considers it as still forming a part of the sanjak of Skutari.

2. The kadilik of Antivari extends over the greater part of the isthmus between the Adriatic and the Lake of Skutari, and is on the N. contiguous to the Austrian province of Cáttaro and the territories of Montenegro. The population is estimated at 10,000 souls. It has extensive plantations of olive-trees, and the quantity of oil which is annually exported amounts to 5000 barrels. Turks live only in the town; the inhabitants of the country are Christians of the Greek and Roman Catholic creeds. The town of Antivari is built on a rocky hill, surrounded by steep moun-

tains, about 2 miles from the sea. It has a castle, in which are 400 houses; the town itself contains 540 houses, and a suburb 160. The whole population is said not to exceed 2500 individuals; but this is probably an under-estimate: it furnishes 600 soldiers in time of war. The base of the hill on which the town is built is washed by a small river, called Richanatz, by which it communicates with the sea. At the mouth of this river is a little bay, in which there is anchorage for small vessels. There are 100 shops in the bazar. The inhabitants are partly Turks and partly Christians. The southern commune of this kadilik is called Markovichi; it consists of a number of villages in a very mountainous tract, called Lissigna, notorious for the great number of poisonous plants which it produces.

3. The kadilik Dulcigno is to the south of Antivari, and extends from the Adriatic to the river Boyana. It is said to contain a population of about 20,000, by far the greater part of whom are Christians. Turks are found only in the town of Dulcigno, where they constitute about one-half of the population. This district produces much oil; about 7000 barrels are annually exported. It has also extensive vineyards, yielding annually more than 1000 casks of wine. Enough of salt is manufactured for the consumption of the inhabitants. The town of Dulcigno is built on an isolated hill forming a cape, which is united to the mainland by a low isthmus. The surrounding country is a plain interspersed with low hills, and very fertile. Dulcigno is the seat of a Catholic bishop, and contains about 1000 houses and from 7000 to 8000 inhabitants, who live mostly on the produce of their estates, except a few families engaged in commerce, or in the fisheries of the river Boyana. They send 2500 soldiers to the army.

4. The kadilik of Skutari comprehends the districts adjoining the Lake of Skutari on the E., S., and W., and the tract of country lying between the rivers Boyana and Drin. The level country E. of the lake was formerly known by the name of the Lower Zenta, and the hilly tract between its western shores and Mount Rumia is called Kraina. The population of this district exceeds 100,000; of whom about one-half are Roman Catholics, and the remainder Mohammedans and Christians of the Greek church. It is a rich country: the mountainous parts are covered with forests containing excellent timber-trees, and the lake and rivers yield large quantities of fish. The merchants of Skutari are rich, and the principal traders in this part of Turkey: they export the produce of the country, consisting chiefly of wool, bees'-wax, hides, hareskins, tobacco, and dried fish, which they send to Trieste, Venice, and Avlona, and import in return coffee and other colonial produce, silk, and several manufactured articles, especially silk stuffs, cloth, brocades of gold, &c. They carry the imported goods to

the great fairs, which are held annually in the towns of Perlepie in Rum-Ili, of Pristina in Servia, and of Elbassan in Albania. The town of Skutari contains upwards of 40,000 inhabitants: it is built not far from the lake, between the rivers Boyana and Drinoss, or Khiri, and consists of three parts—the castle, Tabaki, and Tersia. The castle stands on a high hill, and commands the town and the bazar, a large square building of stone to the E. In the castle is the palace (serai) of the governor, the barracks, an arsenal, and several magazines. The houses of the town, more than 4000 in number, are mostly enclosed by walls, which causes it to occupy a large space of ground compared with its population. In the middle of the streets are watercourses, most of which have sufficient fall to turn mills. The part of the town which is called Tabaki is built on the southern declivity of the hill on which the castle stands, and is only inhabited by Turks. Tersia, inhabited by Christians, is on the E. side of the hill, and is more than 2 miles long and a mile wide; but there are gardens among the houses. The bazar contains 4000 well-arranged shops. There are several mosques in Skutari, one of which, called Aia Sofia, was formerly a Christian church; there are also several Christian churches and convents. About one-half of the population are Roman Catholics: there are a few families of Greek Christians. The Roman Catholics have a bishop here. There are three bridges near the town, two across the Drinoss (one of stone and one of wood), and one (of wood) across the Boyana, below its confluence with the Drinoss.* At Hobotti, the highest point to which sea-vessels ascend the Boyana, are the custom-house and extensive warehouses. A great fair is annually held here. About 4 miles N.E. of Skutari, and near the banks of the Drinoss, is the old town of Drivast, or, as the Turks call it, Drisht, built on the declivity of a rock. It has a castle and about 1000 inhabitants; all Turks, except one family.

5. The kadilik of Podgorizza extends, according to the Turks, over the most northern portion of Albania E. of the valleys of the Zenta and Moratsha, including the countries which contain the Berdas, or allies of the republic of Montenegro. In this kadilik are also the countries of the Climenti, Hotti, Shalla, and Shossi, equally independent tribes, although not allied to the Zernagorzi. The other tribes inhabiting the mountain-regions pay a fixed tribute, and a few Turks are settled among them to collect it. It is only in the level part of the kadilik, which extends along both banks of the Zenta and Moratsha, that any considerable portion of the population consists of Mohammedans. The number of inhabitants of this kadilik does not, in all probability, fall short of 100,000 individuals. The town of Podgorizza is built on the left bank of the Moratsha, at its confluence with the small river

Chicuna, over which there is a long bridge of wood. It contains 6000 inhabitants, four-fifths of whom are Mohammedans, and sends 2000 men to the army, one half of whom serve on horseback. A few miles N. of the town, near the village of Slatizza, at the base of a mountain are the ruins of the old town of Dioclea, now called Dickla, which appears to have had a circumference of about 6 miles. The ruins consist of temples, palaces, and single columns, and an aqueduct of about 12 miles long: Roman coins are frequently found among them; but these ruins diminish rapidly, as the Turks of Podgorizza employ the materials in building their houses. Some miles farther N., near the village of Stiena, are other ruins, called by the inhabitants Gradina di S. Simone. Their origin is not known. Zabliak, or Zsabliak, is a town and fortress built at the influx of the river Moratsha into the Lake of Skutari. The fortress is small, and only inhabited by Turks. The town contains about 250 houses and 100 inhabitants: it supplies 300 men to the army. Spush, or Ispush, is a town and fortress built near the gorge by which the river Zenta leaves the country of the Bielopavlitshi: it contains 2000 inhabitants, three-fifths of whom are Turks. The road from Albania to the Herzegovina leads through the valley of the upper Zenta; but the Turks are excluded from the use of this road by the Bielopavlitshi. East of Podgorizza is the small town of Medun, built near the mountains inhabited by the Kutshi, on the declivity of a beautiful hill in a very fertile tract: it is peopled by Mohammedans, who are famous for their valour, and governed by their own aga, and who supply 200 men to the army. The hilly country surrounding the Lake of Plava, though situated on the northern side of the principal range of the Dinarian Alps, constitutes a part of the kadilik of Podgorizza. In this district are the small towns of Plava and Gusinie.

6. The kadilik of Alessio comprehends the southern parts of the pashalik of Skutari, including the mountain districts inhabited by the Miriditi and Madiani. Alessio, called Lesh by the Turks, is built on the left banks of the Drin, not far from its mouth: near the river is the bazar, and at a short distance the fortress and town. The fortress is small and in bad condition, and contains only the barracks and a few Christian families; but on the other side of the fortress is an extensive suburb, called Varoshi, which is inhabited only by Turks, and is a thriving place. In the fortress is a mosque, which was formerly a Christian church, called S. Nicolo di Bari. In this church the famous George Castriota, better known by the name of Scanderbegh, is buried. Varoshi has more than 1000 inhabitants. The country about this place has very extensive plantations of olive-trees, but a portion of it S.E. of the town is covered with swamps. Several large villages

are found in this plain. Orossi, the residence of the Prenk-Lesci, or hereditary princes of the Miriditi, a small place, is built at the base of Mount Shintit.

II. The sanjak or pashalik of Dúkajin extends over the north-eastern portion of Albania, including the larger part of the Plain of Metoja. This country is also called Dúkaina, and is, for the most part, well inhabited, the population being stated at nearly 210,000 individuals: it is divided into three kadiliks:—

1. The kadilik of Dúkajin, comprehending the south-western part of the pashalik, is mountainous, and contains only the small and decayed town of Dúkajin, situated between mountains on the left of the road leading from Skutari to Prisrend. It was formerly the seat of the pasha, and therefore the pashalik bears its name.

2. The kadilik of Petsh, or Ipek, as the Turks call it, comprehends the upper basin of the Ak Drin and a part of the Plain of Metoja. Petsh, or Ipek, the present seat of the pasha, is built on the banks of the river Bistrizza, at a considerable distance from the place where this river falls into the Ak Drin. It lies in a valley which resembles that of Innspruck in Tyrol. On the N. a high summit of the great mountain-chain is visible: it is called Koprivnik, and is always covered with snow. The town is divided into two parts by the river. They are called Jarin and Csenevia, and are united by a high bridge which rests on five arches. The Bistrizza divides into many channels, and its rapid current turns a number of mills. In the bazar are 960 shops. The population is stated to exceed 12,000 individuals, among whom are a few Christians of the Greek persuasion, and one or two Catholics. The Turks have 16 mosques. Arms are made in this town in great number and of good quality. A kind of apple, called the velvet apple, is grown in the neighbourhood: it has a very delicate flavour, and considerable quantities are sent to Constantinople.

3. The kadilik of Jacova comprehends the central portion of the Plain of Metoja and the adjacent districts. The town of Jacova is a large place, containing 2000 houses and 18,000 inhabitants. The river Ervenik runs through it from west to east, and divides it into two parts, of which the northern is the larger. The number of Christians, both of the Roman Catholic and Greek religion, is but small. The Turks have eleven mosques. There are 1100 shops in the bazar.

III. The sanjak or pashalik of Prisrend contains only a small portion of the Plain of Metoja, but includes a large mountain tract contiguous to the western side of the mountain-knot of the Sharra Dagh. This tract is thinly peopled. The whole population of the sanjak is said not to exceed 80,000 individuals, of whom only 17,000 are Mohammedans. The capital is Prisrend,

or Perserim, called by the Turks also Prisdren, a town of from 15,000 to 20,000 inhabitants, partly Turks and partly Christians of both persuasions. It is built on the river Rieka, about 4 or 5 miles from its confluence with the Drin, which takes place at the village of Stan. The Turkish governor resides in a castle on the adjacent hill. There are considerable manufactories of fire-arms in Prisdren, the guns and pistols made here being much valued. The town also carries on a considerable traffic with the adjacent country, and has commercial relations with many of the large towns in Albania, Rum-Ili, and Servia, on account of the great fair which is held there every year in the month of November.

IV. The sanjak or pashalik of Elbassan extends along the shore of the Adriatic from Cape Redoni, which divides it from the pashalik of Ochrida, to the river Uskomobin, which separates it from the pashalik of Avlona. It extends eastward to the range of the Kandavi mountains. The greatest part of this province is hilly; mountains, properly speaking, occur only in the eastern districts. The most remarkable places are :—

Elbassan, or Ilbassan, a town with a strong castle, in which the pasha resides, is built on the banks of the river Uskomobin, or Scombi, in a very fertile plain, and has 5000 inhabitants, of which number 3500 are Mohammedans, 1000 of the Greek church, and 500 Catholics. Its commerce is supported by an annual fair.

Dúrazzo, called by the Albanese Durtz, by the Turks Dratsh or Drutsh, the ancient Dyrachium, stands on the shores of a bay which is formed by the capes Pali and Laki, and contains between 9000 and 10,000 inhabitants. The harbour, or rather roadstead, is shallow, and vessels of moderate size must anchor at a distance of more than a mile from the shore. Near the town are extensive warehouses.

Pekin, or Peklin, is a small town with 700 inhabitants, built on the banks of the Uskomobin river.

Kavaya is rather a large place, and situated on the banks of a small river which bears the same name, and falls into the Adriatic about 3 miles below the town. It is almost equi-distant from Dúrazzo and Peklin, and contains from 9000 to 10,000 inhabitants, among whom are only about 100 Catholics and from 500 to 600 Christians of the Greek creed. It derives its importance from the fertile plain which surrounds it, and in which a cheese is made which is much valued and exported to remote parts of the Turkish empire.

Tirana, or Terana, is a town enclosed by walls, and built on the river Jacon, which has a very rapid current, but in summer is frequently without water. The plain in the neighbourhood of the town is very fertile, and produces large quantities of grain of

different kinds; there are also extensive vineyards and plantations of olive-trees. Nearly 10,000 persons live in the town; about 1000 are Greek Christians, 150 Roman Catholics, and the remainder Turks.

V. The sanjak or pashalik of Ochrida extends over the whole breadth of Albania from the Adriatic to the range of the Pindus mountains; but on the shore it is narrow, comprehending only the basin of the small river Hismo or Ismo, whilst along the great mountain-range it extends more than 70 miles from north to south. The larger portion of the valley of the Kara-Drin is within this pashalik. Though the eastern portion is very mountainous, it includes a great number of fertile valleys, in which much grain, wine, tobacco, and even cotton is grown; much honey and wax is also collected, and great numbers of cattle are kept. The most remarkable places are:—

Ochrida, an ancient town on the northern banks of the Lake of Ochrida, and on the great Roman military road which led from Pella in Macedonia, through Tesnia and Bitoglia (Toli Monastir) to Dúrazzo; and which, though much neglected, is still used as the common road for troops sent from Constantinople to Albania. It is also the most frequented road for the commercial intercourse between Rum-Ili and Albania. The town, whose population is said not to exceed 1000 individuals, consists of scattered houses built round a hill, on the summit of which is a small fortress, the residence of the pasha. The population is chiefly composed of Greek Christians, mingled with whom are a few Turks, Bulgarians, and Jews. There are mines of silver and sulphur in the neighbouring mountains, but they are not worked.

In the valley of the Kara-Drin are two places called Dibre, distinguished by the epithets of Great and Little. Great Dibre contains a population of 2000 families, and is the residence of a mirimàzim, who lives in a palace enclosed by high walls. Near this place are some baths containing sulphur and saltpetre, which are much used for several diseases. Little Dibre is inhabited by 700 families. A small portion of the inhabitants of the Kara-Drin are Christians of the Greek Church.

Croya, or Kroya, also called Ak-Hissar, is an old town, and famous for having been the residence of Scanderbegh, who was born here. It is built on the banks of the river Ismo, about 12 miles from its mouth, on a high hill, which affords an extensive view over the level country surrounding the town on three sides. Its population is said to exceed 15,000, partly Christians and partly Turks. The great plain which extends round the town is called Mavra, and is very fertile. On the south of the town is a ridge of beautiful hills, which extend to Cape Redoni. In this place are considerable manufactures of arms.

VI. The sanjak or pashalik of Avlona, or Valona, extends over the most southern part of Albania, from the banks of the river Uskomobin on the north, to the range of the Khimera mountains on the south. Its eastern districts are mostly covered with extensive mountain masses, between which, however, there are many fertile, though in general narrow valleys; in the western districts are some plains of considerable extent. In general it is a fertile and populous country. It contains large pine-forests, yielding excellent timber. It produces every kind of grain in abundance, as also olive-oil, cotton, wine, tobacco, and bees'-wax. In many places salt is prepared from sea-water. There are wells of earth-oil in several places, which is collected, and affords an article of export. Valonia acorns are collected in considerable quantities. The most remarkable places are :—

Berat, called also Arnaut Berat, the seat of the pasha, is built on the banks of the river Chervesta, which is also called Arzerta below the town. Berat stands in a valley distinguished by fertility, and producing large quantities of grain, oil, and wine. The population is stated to be between 8000 and 10,000 individuals, of whom two-thirds are Greeks, and one-third are Turks. The Turks live in the new town, which is built above the old. The latter is fortified, but has no drinkable water.

Avlona, or Valona, situated a quarter of a mile from the shores of the bay which bears the same name, is built on a hill, which is surrounded by a wall. South of the town is a small fortress, called Canina, which stands on a steep rock. If the suburbs are included, the town may have a population of between 8000 and 10,000 inhabitants, Turks and Christians. The Christians are principally engaged in commercial pursuits, and the Turks manufacture different kinds of woollen stuffs and arms. The bay forms a sheltered harbour, but the anchorage is rocky and bad. The best is found at the custom-house near the town, and in the most southern recess of the bay, called Porto Ragusano, near a place called Dúkathes. There is a considerable number of Jews in Avlona. Much salt and earth-oil is exported, with olive-oil and valonia.

Mesakia is a small place, near the mouth of the river Voyussa, where vessels frequently stop to take in water, which is of excellent quality.

Dépedelen, a market-town on the river Voyussa, where it is joined by the river Ergir or Argiro, which descends from the Khimera mountains. At this place Ali Pasha of Janina was born.

Argiro, or Ergir Kastro, called by the Turks Erghile, is situated on the banks of the Ergir river; the site of the town is broken by many deep ravines; the different quarters are con-

nected by stone bridges. Above the town is a well-fortified castle, and most of the houses are surrounded by walls, which have loop-holes. This place defends one of the most important mountain-passes (Derbend) in this part of Albania. The population is said to consist only of 4000 individuals, having been much reduced by the plague in 1814.

Klissura is a small town built at the base of a very steep and high mountain, in the valley of the river Voyussa, and on the principal road leading from Albania to Epirus and Greece. Above the town is a fortified castle. The population does not exceed 1500.

Pirimiti is a market-town on the Voyussa, where the river runs in a very narrow valley, and with great rapidity. The great road leading to Epirus passes over a bridge at this place, which is inhabited by 100 families, two-thirds of whom are Turks. It carries on some traffic, as the plain opposite the town and the mountainous country surrounding it are rather populous, containing 120 villages. There are many gipsies settled in this town.

Zagora is a market-town, mostly inhabited by Greeks, among the mountains which separate Albania from Epirus, in a populous and well-cultivated district.

ROADS.—In a mountainous country, large tracts of which are nearly uninhabited, the roads must, of course, be in a bad state, compared with those of more fortunate countries. None of the roads in Albania are practicable for wheeled vehicles, but most of them are for beasts of burden; which are therefore exclusively used for conveying articles of traffic from one place to another. It cannot be said that they are quite neglected, for they are in general sufficiently wide, and bridges are built over the rivers where required. Where the roads pass through swampy tracts they are paved. On the most frequented roads, if they pass through a thinly-peopled district, caravansarai, or *khans*, as the Turks call them, have been built for the accommodation of travellers. Some care has also been taken to avoid steep hills. In the dry months an army not encumbered with heavy artillery could pass along these roads. The most important lines of commercial intercourse between Albania and the adjoining Turkish provinces (Herzegovina, Servia, Rum-Ili, and Epirus) are as follows:—

1. The road leading from Skutari to Nixitshi in Herzegovina runs along the eastern banks of the Lake of Skutari, through several large villages to the town of Zsabliak, and thence along the banks of Moratsha to Podgorizza and Ispush; then, traversing the gorge by which the Zenta enters the plain, it leads through the upper valley of that river by the villages of Frutak and Povia.

North of the last-mentioned place it crosses the low range which separates Albania from the Herzegovina, which in this place is called Planinizza. Descending from this range to the Plain of Nixitshi, called Slivie Pianura, it passes near the place where the small rivers which drain this part of the plain are lost in an opening at the base of the range. From Nixitshi roads branch off in different directions, to Jezero and Piva in Bosnia by Drobniak, to Gasco by Sipatshno, and to Grohovo and Klobuk by Trubiela and Omntish.

2. From Podgorizza a road leads to Ipek. It passes along the valley of the Zievna through Seliste; crosses the Dinarian Alps between Castelli Novi and Gusinie, and after leaving Plava, again crosses the great range near the Mount Baba, into the upper valley of the Ak-Drin, along which it continues to Ipek. This was the road taken by the ambassadors of Venice when they were sent to Constantinople.

3. The road from Ipek to Yenibazar in Servia passes through Istok, and crosses the Dinarian Alps not far from Mount Dobrobuk-Planina. Yenibazar, or New Bazar, is a large commercial town with 20,000 inhabitants, mostly Turks and Jews. It is the seat of a pasha.

4. The towns of Ipek, Jacova, and Prisrend are connected by a road which runs through the Plain of Metoja. Two tolerable roads lead from Jacova and Prisrend across the plains of Metoja and Kossovo Polie, and the range of mountains which separates them, to Pristina in Servia, a large commercial place, whence a road practicable for carriages leads to Uskop or Skopia in Rum-Ili, passing through the famous mountain-pass called Katshanik, on the banks of the river Vardar.

5. A more direct line of communication between Prisrend and Uskop crosses the great mountain-range S. of the mountain-knot of the Sharra mountains, and passes through the town of Kalkandelen. Uskop is a large place with 26,000 inhabitants, for the most part engaged in commerce and manufactures. There are about 2000 Greeks and 4000 Roman Catholics. Several roads meet at this town. In addition to those which connect it with Pristina and Prisrend, one runs eastwards to Filipopoli, passing through the towns of Kumanova and Kosterdil, and another southward to Salonichi and Seres, passing through Köprili.

6. The road which connects Skutari with Prisrend crosses a hilly country S.E. of Skutari to Mied on the Drin river, and afterwards leads eastward over the broken mountains of the Kerubi range, as the valley of the Drin is so narrow in these parts that the road cannot pass along its banks. At the village of Sposs, where a well-built khan is found, the road crosses the river, and then continues along its banks to Prisrend.

7. The road from Antivari to Skutari runs partly through a mountainous country and partly along the banks of the river Boyana. Departing from Antivari, it passes through a narrow valley between high hills, covered with plantations of olive-trees, until the crest of the mountains is attained by a ravine. The ravine leads to a level tract, overgrown with timber-trees: timber is conveyed from this place to the river Boyana. On this part of the road only a few isolated dwellings are met with. The descent to the river Boyana is gradual, and the valley is intersected by low hills. The rocks and stones disappear, and the soil is soft and rich; the road is consequently bad after rain. In the valley of the Boyana it has the banks of the river on one hand, and a rocky ridge of low hills on the other. The river is passed by a bridge at a short distance from Skutari. The road from Dulcigno to Skutari crosses some hilly grounds near the former; it is paved there, and is about 6 feet wide. It joins the road from Antivari to Skutari on the right bank of the river Boyana.

8. The road from Skutari to Alessio on leaving the town of Tabaki passes along the stone bridge over the river Drinoss, which annually inundates the adjacent country, and renders it fertile. The road then turns southward, and traverses the district between the rivers Boyana and Drin. This tract has an undulating surface, and is, properly speaking, an extensive depression between the western extremity of the Kerubi mountains and an isolated but small system of hills which extends along the shore between the mouths of these two rivers. The undulating coast has a rich loamy soil, and is well cultivated: many villages are built on it, as Berlizze, Bushiatti, and Burbulushi, through which the road passes. The last-mentioned village is built on the Drin, which is passed on a ferry at the village of Gramsi. At this place the valley of the Drin begins to narrow, as the hills to the W. of it advance close to the banks of the river. In this part of the valley the soil is less fertile, and the road consequently better, except at some places, which have been paved at some remote period, but are now quite neglected.

9. The road from Alessio to Berat on the Chervesta leads through the countries contiguous to the Adriatic, and is rarely anywhere more than 5 or 6 miles distant from its shores. On leaving the town of Alessio the road runs through a low wood, consisting of wild vines, brambles, and thorn-bushes, which are so entangled that it is impossible to enter them, the more so as the ground on which they grow is an extensive swamp, and lower than the road, which is of convenient width, and paved. This swampy wood extends southward to the banks of the river Matt, but on approaching its banks the ground is higher, and at

some places less impeded by bushes and trees, so as to afford pasture-ground for cattle. On the banks of the river is a khan. South of the river and along the shores of the sea is a wood of full-grown forest-trees. The river Hismo is passed at Ismid khan by a small wooden bridge. South of that river the ground rises, and the road passes near a small fortress, called Fort Skanderbegh, to the village of Lalikh, on the ridge of hills which terminates at Cape Redoni. The hills are mostly covered with wood, except at a few places, where pasture-grounds are found; but there are no signs of cultivation in this hilly tract, whose surface is much broken by ravines. On the southern declivity of this ridge is a fine glen, overgrown with high trees, through which the road leads to a rather level tract, which is used as pasture for cattle, and extends to the banks of the small river Shiakon. The plain continues to some distance, and is then interrupted by some low hills overgrown with trees; but beyond them it continues to the town of Kavaya.

South of Kavaya are some eminences consisting of gravel and pebbles, along the slope of which the road leads till it descends into the level plain on the banks of the river Uskomobin. The soil of the plain is a very soft earth; it is fertile, but the road is hardly passable, except in the dry summer months. The river where crossed by a ferry is about 40 fathoms broad. The plain continues S. of the Uskomobin, and is only interrupted by a few hills of gentle ascent, beyond which the surface is again level, partly cultivated and partly used as pasture-ground. West of this portion of the plain lies the lake of Trébuki (Tre bocche), which is parallel to the Adriatic, and about 8 miles long. The country E. of the lake is flat, and its shores are overgrown with canes and rushes; but between the lake and the sea is a ridge of some height. Near the village of Lusenia, which is built on a hill, is the boundary between the pashaliks of Elbassan and Avlona. After leaving Lusenia the country extends again into a level plain, which continues to the Chervesta river, and in some parts is overgrown with canes and rushes, and in others is used as pasture-ground for large herds of cattle. In this plain is the large village of Karbonater, called by the Turks Karabunar. In approaching the river Chervesta the road passes the base of a range of hills. At Berat the river is passed by a stone bridge, and the banks on the other side are steep and elevated.

10. A road leads from Alessio to Toli Monastir, the seat of the governor-general of Rum-Ili. It branches off from the road just described on the banks of the river Hismo, and continues to run along that river to Kroya, over a level tract, which is, however, swampy in many places. From Kroya it turns southwards to Tirana. The greatest part of this space is occupied by a range

of high hills which are mostly wooded; as the hills are not steep, the roads are tolerably good. The country which intervenes between Tirana and Elbassan, where the hills attain the elevation of mountains, is much more broken. From the last-mentioned place the road runs eastward in the wide valley of the river Uskomobin to Kukusa; but between this place and Usturga (Sturga) the hilly and precipitous chain of mountains to the W. of the Lake of Ochrida is crossed. Usturga is on the banks of the Kara-Drin, not far from its efflux from the lake, and a good road over a nearly level country leads to the town of Ochrida. Between this town and Tesnia is the great range of the Pindus mountains, and the road in crossing them makes a great circuit. From Tesnia a road leads S.E. to Toli Monastir, and another E. to Perlepie, a considerable place, in which fairs are held which are visited from all parts of Albania and Rum-Ili. This circumstance has given more importance to the road just described than the occasional march of the Turkish troops from Toli Monastir to the different districts of Albania.

11. From the town of Berat a road leads eastward in the valley of the river Chervesta through Kusovije, Pereshnik, Dóbrin, and Dússarli to Voskopolie, where it crosses the Pindus range to Koriji. No particulars are given by the Count respecting this road, but he observes that it is much frequented, being the most direct line of commercial communication between Dúrazzo and Salonichi.

12. Another road leads from Berat to Janina (Joannina) in Epirus. After passing the Chervesta by the stone bridge near Berat, the road runs along the base of the high hills, which extend so close to the river on the S., that, properly speaking, the road lies within its bed. At the end of a few miles it leaves the river, and ascends a moderately elevated hill overgrown with bushes. Entering the mountains at this point, the road continues to lie between high ridges to the very outskirts of the town of Janiña. The whole space between the Chervesta and the Voyussa at Klissura is filled up by an extensive mountain-mass, which is only furrowed by narrow glens and ravines, and drained by small rivers. Nearly the whole tract is uninhabited, with the exception of four or five khans built for the accommodation of travellers. From the last of these khans, which is called Jepovo, the road descends a very steep declivity to a small semicircular plain which lies on the Voyussa opposite the town of Klissura. The valley of the river above Klissura is so narrow, that the road has been made over the adjacent hills to the vicinity of the town of Peramiti, where it again descends to the banks of the Voyussa. Even near Peramiti the level space between the river and a very high and steep ridge of hills is of so little extent as to leave only a very

narrow road. Opposite the town of Peramiti the hills recede from the banks of the river, and encircle a plain of some extent, which is well cultivated. Above Peramiti the road at times runs between the banks of the Voyussa and steep hills: at times where they terminate in precipices on the edge of the water it crosses their crests. Upwards of 20 miles from Peramiti the road leaves the valley of the river, and ascends a steep acclivity to a high table-land, on which stands a village called Ostaniji, consisting of more than 100 houses. At some distance behind this place is the crest of the Khimera range, and on it an elevated summit, Mount Jumerka. The mountains are covered with fine forests, and extend for a great distance on an undulating plain, whose surface is only broken by small watercourses. Proceeding southward a fine valley, which may be from 3 to 4 miles wide, and in which the town of Kuniji is situated, is seen on the left. This valley is drained by a river which falls into the Voyussa. Farther on the mountain plain is intersected by ridges, and in one of the depressions is the village of Revenia in a tolerably well cultivated valley. Behind this village the ridges decrease in elevation, and at last give way to the undulating plain, on which the town of Janina is built, on the banks of a lake which is about 4 or 5 miles long. Janina contains a population of about 36,000 individuals, among which are from 6000 to 7000 Jews, and 20,000 Greeks. The houses of this town stand closer together than those of Skutari, but are not so well built.

IV.—*Extract from* Baron KOLLER's *Itinerary of his Tour to Petra, describing an Inland Route from Mount Sinai to Akabah.**

March 18*th*, 1840.—Left the convent of Mount Sinai at 4 P.M. From the majestic Wady Raha (about 1400 paces broad, and running N.W.—S.E. to the convent) we turned under the hill of Aaron into the Wady Scheik, 400 paces broad, and running in a north-easterly direction. After marching ¾ of an hour, a violent storm, accompanied by heavy rain, obliged us to pitch our tents.

19*th*.—The storm continued: the rain, falling in torrents,

* A chart of the route, and a detailed topographical sketch of the vicinity of the monastery at Mount Sinai, accompanied this paper. It has not been deemed necessary to have the route engraved, as the great precision of Baron Koller will enable readers to trace it for themselves on the maps. This account of the most direct route from Sinai to Akabah is a valuable supplement to the information respecting the peninsula of Sinai contained in Rüppell's route from Suez to Akabah, the travels of Count Leon Laborde, and the paper by Mr. Robinson in the Journal of the Royal Geographical Society, vol. ix. pp. 295-308.—ED.

formed a number of highly picturesque cascades among the surrounding rocks. The wind blew down several of our tents. We were not able to proceed on our journey before ½ past 3 in the afternoon. Further on, the Wady Scheik becomes wider, being about 800 paces across. The tomb of the Sheik Saleh is on the right. The Wady is overgrown with low shrubs of a yellowish-green colour, which from a certain distance produce the same effect as if it was covered with grass. The bare mountains on both sides assume a variety of picturesque forms. At 6 o'clock we entered the narrow defile el Wúttaiyah, which leads to a wide, open plain, el Jermiyeh: the direction of both is from S. to N. From this plain the Wady Tarfa runs S.W., and, as the Beduins assured me, to el Selif and Wady el Ush. We encamped on the plain of el Jermiyeh.

20th.—Left at 7 in the morning. After 3 hours' caravan march we entered the Wady Sélega; direction N.E.; ground stony. 3 hours more brought us to the Wady Saranig. The hills which border it on both sides are of sandstone, frequently presenting strata of reddish colour. 8 hours after our departure the route turned E.N.E., the Wady Saranig widening into an open plain. A valley, called W. Abbiad, runs S.W. After travelling 2 hours more we encamped on the Wady el Aráde, a large plain.

21st.—We set out at ¼ past 7 A.M. The Jebel Aráde rose before us on the right, the Jebel el Byar on the left; Wady Sal and Wady Hothera (a name which recals the Hazeroth of the Scriptures) remaining on the right. At 9 we saw a Wady running S.S.W., and were told by the Beduins that it led through Wady Marra to Wady Sal, but was not passable for camels. The sand is of a remarkable tenuity. Our direction, which till now had been E., became, at ½ past 10, E.S.E., and we entered the Wady Jelim. ¾ of an hour later we passed by a wady running S., as the Beduins said, to Wady Sal, but which they assured me was impassable for camels. Our direction was E. (4 hours' march). About 5 hours (from the time of setting out) we entered the Wady el Ain, which takes its name from a spring ("Ain," the eye, a name given to all springs), situated at its further extremity. The Wady Byar runs from here N.W., leading, according to the Beduins, to Derb el Haj, the caravans' route. Our direction was N.E.: the ground is of a bright yellow colour, too dazzling to look at when the sun shines. After travelling 7 hours we descried, on a ridge of hills to the right, the remains of six or seven of the small stone dwellings of the ancient anchorites. The Wady el Ain now takes a N.N.E. direction. There were many Tarfa shrubs, called by the Arabs "athl." The hills on the left are higher than those on the right. After travelling ¾ of an hour more we reached the spring. It lies in a hollow among rushes

and sedges, with here and there groups of stunted palm-trees, resembling bushes; contiguous masses of granite forming a natural wall around it. The sandstone hills bordering the wady are of the colour of cinnabar. We filled our water-skins; the water has not a good taste, but it served for cooking, and for economizing that which we had brought from the convent of Mount Sinai. From this point the Wady el Ain becomes narrower: the colour of the hills is violet and red. Our route continued N.E. We passed the defile Mirat el Krut, which leads into a wady having an air of perfect desolation. The bottom of this valley is the dry bed of a torrent, full of stones, many of them round, conglomerated, their size varying from that of a pea to five inches in diameter. I remarked in several places white hollows, having the appearance of chalk-pits. Our route now turned N. At 5 P.M. (after nearly 10 hours' journey) the Beduins pointed out the mount before us as the Jebel el Tyh. We entered a large oval valley, Wady E'ssauâne (flintstone valley), bordered by hills, and containing a few scattered mimosa-trees. We encamped, 10 hours from the time of starting (having lost ¾ of an hour at the spring), on the N.W. side of the wady, at the foot of precipitous rose-coloured hills.

22nd.—Started at 7 A.M. Passed a narrow defile, and entered Wady Shibekha, which is narrow, bordered with hills on both sides, and runs downwards in a north-easterly direction. After travelling 1½ hour, the Wady Shibekha becomes wider, and a few mimosas are scattered on the stony soil. From this place a wady runs to the right, towards the Wady Nuebbe, near the Gulf of Akabah, which is marked on Arrowsmith's map of Egypt "Noweyba;" and is, as the Arabs assured me, 13 caravan hours distant. After journeying 2½ hours we saw, through an opening of the Wady Shibekha, the mountains on the other side of the gulf, but not the sea. Direction of our route N.N.E. At the extremity of the wady a defile, called Derb el Samra, leads between rocks of a greyish granite into the Wady Atteiye. Three hours from starting, two transversal valleys to the right and left. The ground appears to be the dry bed of a torrent; mimosa-trees languish in the sand. Route N.E. Shortly afterwards during ½ an hour due N., after which N.E. as usual. The tomb of the Sheik Atteiye on the left; the Beduins stick branches of mimosa in the ground around it. Five hours from starting the Wady Atteiye becomes wider. Elevations like breastworks are seen. Route N. Count Laborde's map on this side only extends to this point. The Wady Atteiye is surrounded by sandstone hills: those on the right are called Jebel Herte. After travelling 8 hours we reached the Wady el Hessí. From the tomb of the Sheik Atteiye the direction

of our route was during 1 hour N.E., it then turned N.W., and S.E. downwards to the dry bed of a torrent, when it again became N.E. After a 10 hours' ride we encamped in the Wady Hessí. The surrounding hills are of the same colour as the mountains at Thebes, the ground a coarse sand, with scattered shrubs.

23rd.—Set off at ¼ past 7. In 1¼ hour arrived at a place called el Mashash (the conflux), wherein water is found. The wady takes the same name. The camels drank with great avidity. The skins were filled; the water is good for culinary purposes and for washing, but not drinkable. After travelling 2 hours, we saw some high mountains on the left (N.W.), which for some distance seemed to run parallel to our route. I believe they are those near the Derb el Hadj.* The wady is about 300 paces broad, bordered by sand-hills, shrubs growing on the stony soil. After travelling 3 hours, we entered a hilly, mountainous tract of country, called el Tyh. Half an hour later the direction of the route was E.N.E. The above-mentioned high mountains seen on the N.W. Heat intense till 10 o'clock, when a S.E. wind regularly sets in. After travelling 5 hours, we descried, from an eminence, the mountains of Akabah. We went down a steep descent into the Wady el Sott (terrace). Direction of the route E.N.E. We now saw distinctly the above-mentioned chain of mountains, which terminates towards the N.E. like a promontory. To this last point the Beduins give the name of Tarf el Rokhn. On Arrowsmith's map it is called Dharf el Rokob, but I think is placed too much S.E., and too far from Akabah, the real distance not being more than 10 hours' journey. For ½ an hour the direction of the route was N.E.; we then, after having travelled 6 hours, descended into a plain still bearing the name of el Sott. We next turned E.N.E., the plain on the left extending to the Tarf el Rokhn, distant 5 hours. The chain of mountains connected with the Tarf el Rokhn appears to run from N.E. to S.W. Eight hours from starting the Wady Sott becomes wider. On the right we saw the Arabian mountains, beyond the gulf, but did not discover the sea. A range of pointed hills, called by the Beduins Jebel Sott, seemed to bar our passage. As the plain descends, the Tarf el Rokhn is no longer visible. Direction of the route E.N.E. After travelling 9 hours, we encamped at a place 1½ hour distant from the caravan route.

24th.—Started at ½ past 7. In an hour after reached the Ras el Nagb (head of a defile); the way leads between two hills to an eminence, from which is seen the head of the gulf near Akabah. Direction E. Road descending on stony ground. In

* Arrowsmith's Egypt; Odjime hills.

$1\frac{1}{2}$ hour from starting arrived at the Derb el Hadj, which runs from Suez to Akabah. On the left is a perpendicular sandstone rock, 7 or 8 yards high, with red and white strata. The road descends to the sea; it is from 30 to 40 feet wide, cut out of the solid rock, and truly magnificent, resembling the scientific alpine routes of Europe. Large masses of stone piled up on the left, where there is a precipice, serve as a parapet. The scene calls to mind the Apennines. At intervals the dark blue sea is seen below, with the high chain of mountains beyond it. A strong N.W. wind rendered the weather somewhat hazy. The road called Nagb continues to descend, and over conical rocks of a dark-brown colour and volcanic appearance, the broad expanse of the sea now became visible. On several of the sections of the surrounding chalk hills I observed strata of black flintstone. The last part of the road which we travelled over, $3\frac{1}{2}$ hours after starting, and which leads to the sea, is called el Mhasserat. Four hours after starting we descried Akabah, indicated by a green stripe of palm-trees. A hollow way brought us, $\frac{1}{2}$ hour later, to the seashore, which we followed in an E.S.E. direction for $1\frac{1}{4}$ hour. It was 1 o'clock when we pitched our tents under the palm-trees of Akabah near the fort. During our ride along the shore I observed a mirage.

From Akabah I proceeded to Petra, through the Wadies el Araba, Garandel, Abu Shebe, &c.; from Petra to Hebron, through the Wadies el Araba, Figgeri, over Mount E'Sáfah, through the Wadies el Gubba, Athaige, Sikke el Kermel, &c.

V.—*Notes on Depuch Island.* By Captain WICKHAM. Communicated by Captain BEAUFORT.

DEPUCH ISLAND, on the N.W. coast of New Holland, is in lat. 20° $37\frac{3}{4}'$ S., and long. 117° 44′ E., and presents a singular contrast with the low, flat shores of the mainland, from which it is only a little more than a mile distant. It is of a circular form, nearly 8 miles in circumference, and its summit is 514 feet above the sea.

This island is merely a vast pile of large blocks of greenstone, heaped up in rugged and irregular masses: it has much the appearance of basalt, and in many places the long, flat-sided blocks resemble columns of that formation. Here and there in the valleys, and upon the more level spaces near the summit, is a slight sprinkling of soil that nourishes a few stunted gum-trees, shrubs, and a coarse wiry grass; but, generally speaking, the island is void of vegetation, and has altogether a very different

appearance from the mainland and the other islands of Forester's group, of which it is the largest.

With the exception of Depuch Island, the other islands of this group are very low; each being merely an accumulation of sand, upon a base of light-coloured rock, that is composed chiefly of sand and shells. They are in some places thickly covered with brushwood and coarse grass, and their greatest elevation is not more than 50 feet.

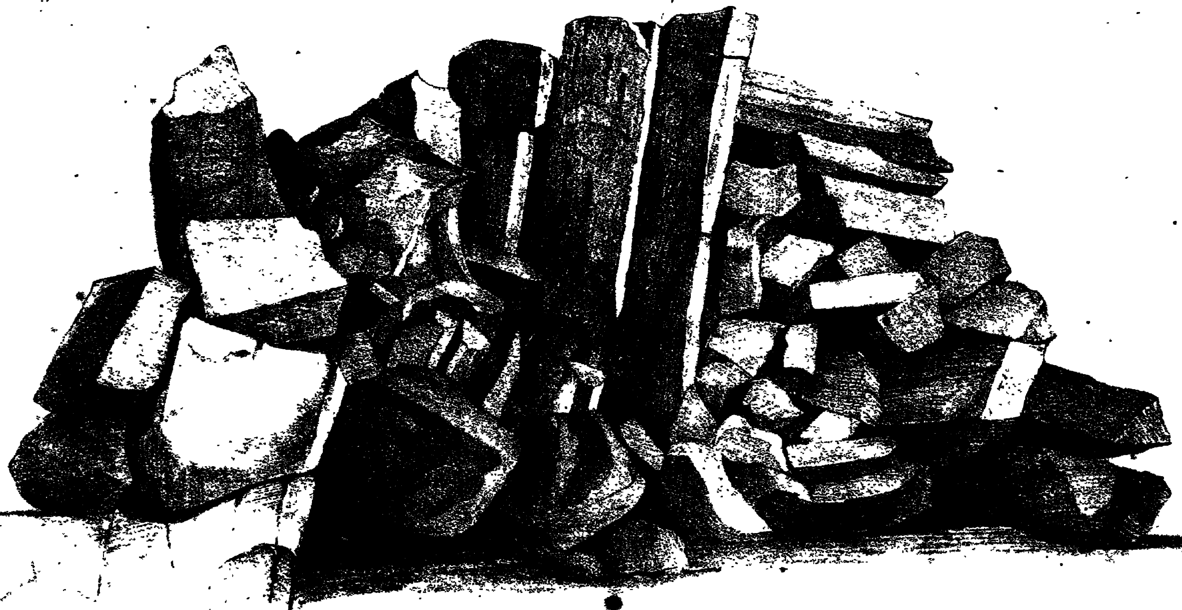
All these islands are connected to the mainland by extensive flats and ridges of sand, which in many places become quite dry at low-water spring-tides, and afford great facility to the natives in reaching them for the purpose of procuring turtle and fish. Indeed, as nothing was seen to lead us to suppose that canoes are used on that part of the coast, it appears more than probable that it is only at such periods they are able to visit them.

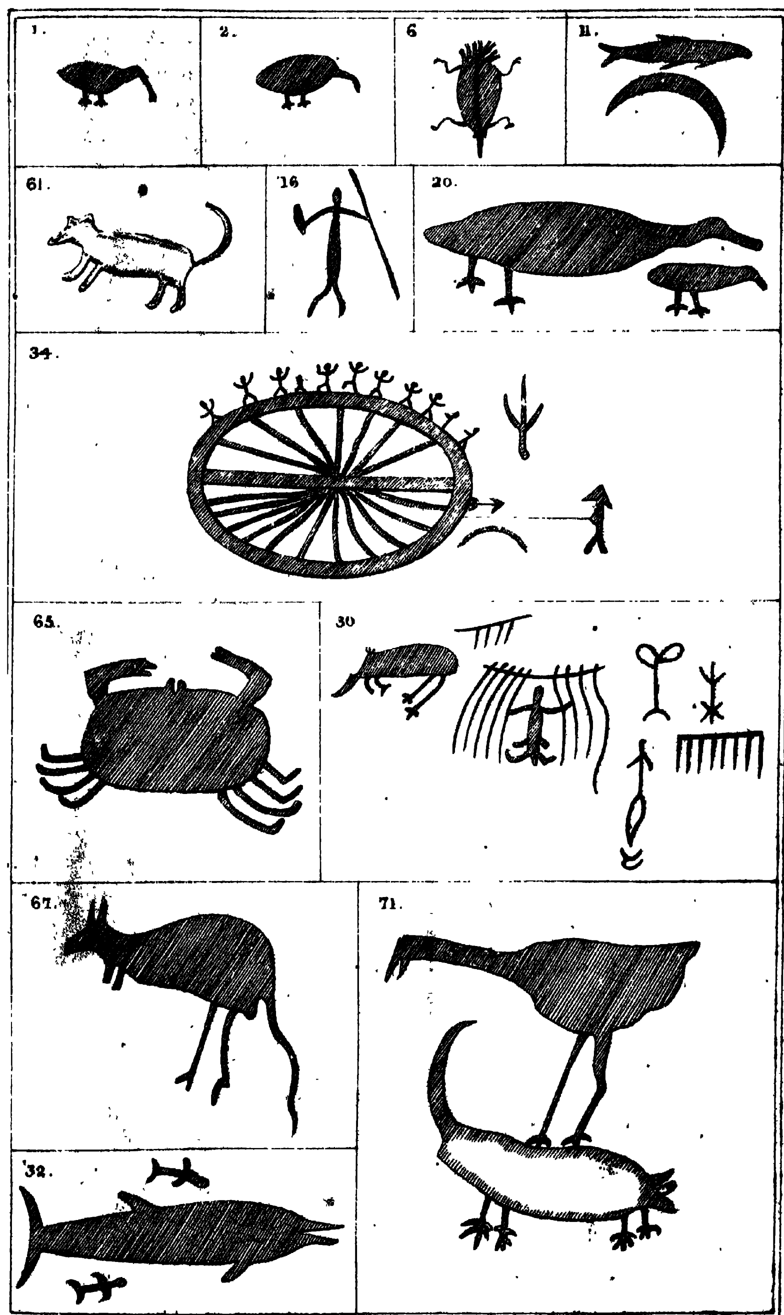
Depuch Island appears to be their principal resort, probably on account of the water they find amongst the rocks after rainy weather, and the facilities afforded them in the exercise of their talent for drawing representations of whatever they have seen upon the flat surface of the rocks of which that island is formed.

From the vast number of specimens of the art, the natives seem to have amused themselves in this way from time immemorial; and from the very hard nature of the stone, and the accuracy with which many animals and birds are represented, they deserve great credit for patient perseverance, and for more talent and observation than is usually bestowed upon the natives of New Holland; and to their greater credit be it told, that, amongst the numerous representations we saw, none were observed to tend in the slightest degree towards obscenity.

The method pursued in tracing the different subjects appears to be by cutting the surface of the rock with sharp-pointed pieces of the same stone; and as the exterior of all parts of it is of a dark reddish-brown colour, the contrast becomes great when that is removed and the natural colour of the greenstone exposed. It is difficult to conjecture what many of their drawings are intended to represent, but others are too well done to admit of a moment's doubt. Probably many of the inferior performances were the work of the children.

From the summit of the island we had a good view of the mainland for several miles from the sea; and, with the exception of a few isolated rocky hills of the same greenstone, or basaltic formation, that are 6 or 7 miles from the shore, it appeared to be very low and level. Many places had a very white appearance, as if covered with a salt incrustation, and the whole was intersected by creeks that extended a long distance in, and probably flood a great part of this extensive flat, when spring-tides are


Height 14ft. 8in.
3ft 8in
2ft 10in
2ft 10in
1ft 10in


1.
2.
6
11.
61.
16
20.
34.
65.
30
67.
71.
32.

accompanied by the strong north-westerly winds that are at times felt upon this part of the coast during the prevalence of the westerly monsoon.

While the Beagle remained at Depuch Island no opportunity offered of communicating with the natives, nor did they visit the island during that period. They were seen on the shore of the mainland upon one or two occasions; but as soon as any attempt was made to approach them in the boats they fled precipitately. Like most of the natives of that country who have never seen Europeans, they are timid, and probably treacherous when their numbers exceed those of the opposite party. The following trifling circumstance justifies this apparently harsh suspicion. Mr. Fitzmaurice (mate), while employed in a whale-boat in surveying a part of the coast a little to the eastward of Depuch Island, entered a creek for the purpose of ascertaining its extent, but had not proceeded far before his progress was stopped by the near approach of the mud-banks, rendering it too narrow for the oars. He was not long in this position before he was startled by a loud shout, and the appearance of a party of natives rushing simultaneously from the mangroves on each side of the creek: they stopped at a short distance from the boat and made threatening gestures, by brandishing their spears. No doubt violence would have ensued had he persisted in his attempt to proceed farther into the creek, but he very properly backed his boat out, and retreated; it being, perhaps, better, when practicable, to allow the natives to imagine themselves the stronger party than to teach them experience upon such a subject by the use of fire-arms, which must have been resorted to had spears been thrown.

There is a very good and well-sheltered anchorage off the sandy beach on the N.E. side of Depuch Island; but with this exception, it offers no inducement to visit it again. A trifling supply of fire-wood may be procured from the stunted trees that grow in some of the valleys; but water is not to be depended upon at all seasons of the year, although there were evident marks of a very bountiful supply during the rains. We dug wells wherever a level spot held out any prospect of success; but our labours were generally obstructed by reaching a bed of white calcareous rock, from 9 to 15 feet below the surface. With one well in the sandhills at the N.E. bay we succeeded in reaching to the depth of 21 feet, where we found a bed of sandstone, sufficiently soft to yield to the united effects of pickaxes and crowbars: the laborious work of cutting through this was carried on a few feet farther, when our exertions were stopped by a stream of water flowing in as salt as the ocean. Fortunately a small reservoir was discovered by Mr. Bynoe, the surgeon, while climbing amongst the rocks in search of a fresh meal, from

which we got about 6 tons of indifferent rain-water, but at the expense of very harassing labour, as it was carried on the men's shoulders, in 7-gallon barricoes, over the most rugged path one can well imagine. This supply enabled us to remain a few days longer on the coast, when we were compelled to cross over to Timor, for what was not to be procured on the inhospitable and sandy shores of N.W. Australia.

*Description of some of the Drawings sent along with Captain Wickham's Paper.**

No. 1. appears intended to represent a goose or duck.

2. A bird that is found near some of the rivers in the southern parts of N. Holland, and in some degree resembles a Guinea-fowl.

3, 18, and 82. Boomerangs.

4. Probably a swan.

5. An ibis.

6. A beetle.

7. Seal or otter.

11. Can this have any reference to fishing by moonlight?

12. A shield; also a native with spear and shield.

13. A dance of native children.

16. A native armed with spear and womerah, or throwing-stick, probably relating his adventures, which is usually done by song, and accompanied with great action and flourishing of weapons, particularly when boasting of their prowess.

17 and 18. The print of a foot in the mud or sand.

19. Probably meant to represent the eggs of the emu, as laid in the nest.

20. Ducks.

21 and 22. Plants.

23. Probably a shark.

24. A native dance.

28. Unless the natives have an idea that the earth is globular, it is difficult to conceive what is here meant, as animals and human beings are intermixed.

29. A tree or shrub.

30. A native in a hut, with portions of the matting with which they cover their habitations. The huts we saw at Depuch Island were constructed by fixing boughs and twigs in the ground in a circular form, and joining the smaller ends overhead in the form of a bee-hive. This is covered with a loose matting of grass, being merely long shreds of twisted grass fastened in the middle to a cord of the same material; the ends hang loosely down.

* Lithographic impressions of the drawing of the rock on which the figures are found, and also of some specimens of the figures, with the numbers prefixed to them in this list, accompany this Part of the Journal.

31. Is probably the hooded iguana, or some reptile of that description.

32. Sharks.

34. A corrobory, or native dance.

35 and 36. Impressions of birds' feet in the mud.

37. Land or water tortoise.

42. Turtle.

51, 53, 62, 63. The native companion.

52. Pelican.

55. A kangaroo, wounded by a spear.

56. Snake, &c.

60. A kangaroo.

61. A native dog.

65. A crab.

67. A kangaroo.

68. Appears meant to represent the sea-slug, or bèche-le-mer.

70. Is probably some animal or insect with which we are unacquainted.

71. Appears to be a bird of prey, having seized upon a kangaroo-rat.

73. Appears to be meant for an iguana, probably that described by Dampier.

76. A burial-place. In the southern parts of New Holland a well-cleared and secluded place is chosen; frequently a circular mound is raised over the body, round which several narrow circles are described. These places are held sacred, and kept exceedingly neat, and free from shrubs; frequently the trunks of the surrounding trees are carved over with various devices.

86. Probably an otter.

87. Kangaroo and emu.

92. May probably be meant to represent a native afflicted with a similar disease to that from which the natives in parts of Africa frequently suffer.

94. Appears meant to represent two natives in some particular costume. This drawing was upon the face of a very conspicuous block of stone in Watering Valley, and from 40 to 50 feet over head.

The drawings that are shaded throughout show those where the surface of the stone was entirely cut away: the others were only in outline.

VI.—*Communications respecting the Geography of Southern Abyssinia.* By Dr. C. Tilstone Beke. Communicated by the African Civilization Society.

1. *Notes on the Geography of Shwá.*

Ankóber, 3rd March, 1841.

It is with no small satisfaction I sit down to write to you from this country. When I wrote from Fiálu I had really some doubts whether I should ever reach it: not that I absolutely feared for my life; but it seemed probable that difficulties would be thrown in my way which might oblige me to return. Fortunately the father of Mohamed Ali (in name my protector, but in reality the source of all the obstructions I met with) was not at home, and I was allowed to continue my journey.

I reached Fárri in 47 days from Tajúrrah: I was in hopes to have arrived here in time to observe the eclipse of the moon, which took place on the 5th of February; and I did reach Fárri, having performed the distance from Dobhlín to that place in 24 hours; but the weather was so bad that I could do nothing. I arrived at Fárri just in time to escape the short rainy season, which continued from the day of my arrival till the day before yesterday—25 days in all. As I travelled just before it began, you may conceive I had drier weather than Messrs. Isenberg and Krapf. This may account for my meeting no elephants till I came to the shores of the Hawásh, whereas they found them a long way off. That river I understand is at present so much swollen that a Bedawi caravan on its banks is unable to cross it.

I flatter myself that the Map of Captain Harris and the Table of Observations* I now forward to you will be allowed to be a valuable addition to the geography of Africa. When I get my notes in order you shall have a number of bearings, and also, perhaps, some slight alterations and additions to the map; but I apprehend it is on the whole pretty correct. My observations cannot be very far out, though you will make allowance for a young observer, who is short-sighted and has only a small instrument. Whatever my imperfections, you may rely upon my being a strictly conscientious traveller. I put down just what I observe, and shall be the first to point out my own mistakes whenever I

* Along with Dr. Beke's letter was received a copy, made in the Chief Engineer's Office, Bombay, of the "Map of the Route from Tajúrrah to Ankóber, of the Mission under Captain C. Harris, to the Coast of Shwá, 1841; surveyed by Assistant-Surgeon R. Kirk and Lieut. Barker, I.N." It has been deposited among the Society's charts. The astronomical and meteorological observations alluded to are given in an appendix to Dr. Beke's communications.

find myself in the wrong. My pocket thermometer is broken; that of Newman had the upper end chipped off, but fortunately has not been rendered unserviceable. I have, however, sent to Aden for others; and having heard that the Negus has a barometer which belonged to the late Mr. Airston, will inquire about it, and if it is in existence make use of it.

By my observations you will perceive that the latitude of 9° 36′ 30″ N. may pretty safely be assumed for Angolálla. Guráge, I am told by a native, is 8 days to the W. (and perhaps a little to the S.) of Angolálla. Léimu (Límmoa?) is said to be 3 or 4 days beyond it. The governor of Guráge, who arrived at Angolálla just before Mr. Krapf and I left, told us that he (an old man) had travelled from Guráge to Angolálla on foot in 4 days.

Combes and Tamisier were really in Shwá, and consequently were the first European visitors since the time of the Portuguese Jesuits. After them came Dufé (also a Frenchman), who died at Jidda; thence Isenberg and Krapf (Germans); next Rochet; and lastly, myself, being the first Englishman. Mr. Airston and Kielmaier died, you know, on the road; the former at Fárri, the latter at Amáile.* As I am the first Englishman who has reached Shwá, so I believe I am the first traveller who has had it in his power to give something like a satisfactory account of its geographical features. Fátigar, belonging to Shwá, I hope to visit, and lay down at last the course of the Portuguese correctly.

You will perceive that I make Angolálla 8400 feet above the ocean, and Ankóber only 8200. This is quite against the evidence of the senses; and Mr. Krapf on our road hither pointed out to me the height of the Chakka mountains and of Ankóber, and asked how it was possible for Ankóber to be lower than Angolálla: nevertheless I had my doubts, which were soon confirmed on my arrival here. It is true Ankóber is situated in a high mountainous country; but the country at the western base of the Chakka mountains is more elevated than that from which they rise on the E. side, and ascends gradually as far as Angolálla, which, though in an apparently lower position (situated on an undulating plain), is in reality higher than Ankóber. I cannot say how much further to the westward the ground continues to rise; but the Chakka mountains are the water-shed between the Hawash and the Nile; and the Berésa, which we cross on the road to Angolálla, is an affluent of the latter.

* Dr. Beke asks in his letter, "Did Martin, a German, come through Gondar and return the same way?" The question appears to refer to Martin Bretzka, a hunter in the employment of Dr. Ruppell, of whom that traveller says, in the Preface to the second volume of his Travels in Abyssinia—"he returned at my expense to Abyssinia in 1835, and is reported to have penetrated from Gondar to Shwá in 1837."—Ed.

Fancy my finding here, within 10° of the line, dog-roses, honeysuckles, and jasmine; and blackberries in the hedges, stinging-nettles in the ditches, and buttercups in fields of grass quite as fine as those of England. But there is every climate here within the extent of a few miles, and the country will produce everything. Lower down are cotton-fields; and in the valleys limes, tamarinds, the sugar-cane, &c.

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2. *Information respecting the Countries S.W. of Shwá.*

Angolálla, May 29, 1841.

The Negus having sent for me to prescribe for him and several persons about the court, I have had an opportunity of obtaining from one of his slaves, a native of Naréa, some information respecting the place of his birth, and the surrounding countries.

Dilbo, the slave in question, was taken from his native country about ten years ago; he had a son before he left it, and has at present the appearance of a man from twenty-seven to thirty years of age. He retains perfect command of his language, which is a Galla dialect, differing from that spoken by the tribes dependent on Shwá. Limma, the native country of Onáre, from whom M. Jomard obtained the information he has published about the Galla, is well known to him; it is a mountainous country, forms part of Naréa, and the language is the same that is spoken throughout that kingdom. Dilbo had little difficulty in understanding many words and sentences in M. Jomard's memoir (disfigured though they be by misprints, &c.) which were unintelligible to M. Krapf and his Galla servant, who is a native of Shwá.

Naréa is inhabited by Galla: the king and most of his subjects are Mohammedans. They are circumcised: the pagan Galla both in Naréa and Shwá are not. M. Krapf and his Galla servant corroborate this account, though contradictory to the statement of Onáre; and observations of my own incline me to believe that the Galla never are circumcised except in the event of their becoming Christians or Mohammedans.

The average elevation of Naréa above the sea is less than that of Shwá, and the climate is consequently warmer. Dilbo compares it to that of the market-place of Aliu Amba (6 miles E. of Ankóber) frequented by Adál (Dankáli) merchants, who find Ankóber disagreeably cold. Naréa is very fertile, and contains large forests of coffee-trees. Iron, which is wrought by the natives, is found there, but no other metal, so far as Dilbo was aware.

The rainy season lasts six months. The inhabitants are of various shades of colour: some nearly black; others, to use Dilbo's expression, nearly as red (we should say white) as ourselves. The currency consists of pieces of rock-salt (amole) from Tigré, which are brought by caravans from Gondar and Gódjam; but in the retail dealing of daily life barter prevails to a great extent. A good slave may be purchased, according to Dilbo, for 30 amole (6*s.* sterling). Austrian convention dollars with the head of Maria Theresa find their way thither, but are not in general circulation as in Abyssinia.

Dilbo states that beyond Naréa to the W. and S. there is a very large river which he calls the Gó-job. He represents it as rising in the country of Góbo; flowing through Gúfte and Thambára; next between Naréa and Káffa, and then beyond Janjero, to "the country of the Arabs," by which of course he means that it reaches the shores of the Indian Ocean, frequented by the Arabs. According to Dilbo the Gó-job is as wide as from this place to Chérkos (about 3 miles English), and is crossed in boats, capable of containing fifty or sixty persons, in which they transport horses, mules, grain, cloth, and all sorts of merchandise. These boats are cut out of a single tree, and the construction of one takes a whole month. The inhabitants of Káffa are pagans, but not Galla: their language is different, and they are circumcised. The country lies higher than Naréa, but the inhabitants are of all shades of colour. Beyond Káffa the Gó-job is joined by the river Omo, coming from the country of Dóko, of the savage state of the inhabitants of which Dilbo relates strange stories They appear to be simple and easy victims of the stratagems of the slave-merchants.

Dilbo states that the caravans from Gondar and Gódjam arrive in Naréa at the market-place of Súkka, having on their way passed through Gúderú, and crossed two rivers, the Dámbi and Gibbe. The latter river he distinctly and repeatedly said has its course to the Abái, and not southward; and its sources, which he has himself visited, are in the heart of Naréa. When information is, as in this case, so totally opposed to what we have been in the habit of believing to be the fact, one can only repeat what one has heard. M. Krapf and I took every precaution, by repeating our questions in different forms, by making him draw the courses of the rivers on the ground, &c., to elicit the truth. He was uniformly consistent in his statements. Dilbo was not further acquainted with the particulars of the caravan-route to Gondar, having never travelled it: he was brought to Shwá through the country of the Galla.

He gave us the route along which he was brought, and the time spent in the journey :—

		Days.	Days.
From	Naréa to Nénno	3	
	Stopped there		5
„	Nénno to Agabja	2	
	Stopped there		2
„	Agabja to Addiá	1	
	Stopped there		1
„	Addiá to Sóttó	1	
	Stopped there		5
„	Sóttó to Roggia	1	
	Stopped there		30
„	Roggia to Gólbe	1	
	Stopped there		1
„	Gólbe to Chakka market . .	1	
		10	44

The journey from Naréa to Ankóber occupied in all 54 days, but only 10 of them were travelling days. Dilbo says the whole distance might easily be accomplished on a mule in 8 days.

Dilbo's account differs so entirely from that of Onáre, as reported by M. Jomard, that any attempt to reconcile them, or patch up an idea of the country by combining them, would be idle. In corroboration of Dilbo's statements, it may be remarked that a map constructed by M. Krapf from materials collected by him in the course of several journeys within the kingdom of Shwá, places Roggia, Sóttó, Addiá, and Nénno nearly in the same situations that he does. When Messrs. Krapf and Rochet accompanied the Negus on his expedition against the Mécha Galla in January, 1840, they approached within one day's journey of Gundêberat, from a high mountain in which district Dilbo says the country of Naréa is visible.

That a large river does actually flow to the eastward beyond Naréa and Janjero may be taken as an established fact, from the coincidence in this respect of many accounts, corroborated by information to the same effect, obtained by M. Krapf from natives of the latter country. Janjero is the name given by Dilbo to the country named Gengero or Zingero (properly Zhenjeró) in the maps, and he says it is so called by the natives themselves.

3. *Notes on a Journey from Ankóber to Gédem, in Shwá, in April and May,* 1841.

In the course of last Lent Mr. Krapf and I learned that the Negus was sending a body of men to Gédem, ostensibly for the purpose of shooting elephants, and we applied for permission to accompany the expedition. Our application was refused; but

towards the end of April he sent to ask when we wished to go to Gédem to shoot elephants. We replied that we were ready to start immediately, and accordingly two days afterwards we left Ankóber. Subsequently we found reason to believe that the Negus in sending us intended to promote a political object of his own; we were actuated more by a desire to visit an unexplored country than by the mere love of sport; and thus the purposes of both parties were served, the elephants which we did *not* shoot being merely a pretext on either side. We left Ankóber on the morning of Monday the 26th of April, accompanied by six servants and an *affero* (one of a body of 400 men whose duty is to wait upon foreigners) appointed to escort us. Between guns and pistols we had altogether eight *bouches-à-feu*, and it will appear from the sequel that these formed a very important item in connexion with our mission. I will give the proceedings of our journey day by day as they occurred.

April 26th.—Left Ankóber at $9\frac{3}{4}$ A.M., and descended winding and skirting the range of mountains on which Ankóber stands. In 1 hour we came to Mákhal Wans (River), the meadows in the neighbourhood of which belong to the Negus and supply fodder to his stables. The Negus has also a country house here, placed, as all dwellings in this country are, on account of the rains, on a small *amba*, or conical hill. Passing this we kept ascending, till we reached the ridge which divides the river Mákhal from the Máutek, where we had to alight and descend the steep side of the mountain on foot, leaving Mount Emmámret and the village of Máutek to the left. At 1 P.M. we crossed the Máutek, running nearly N. and S. It joins the Dinki, which is crossed on the road from Ankóber to Goncho. M. Emmámret, which is the highest point of the range of mountains running from Ankóber northward, is extremely high, and its base is covered with thick forests, from which the city is supplied with wood. Its peak is visible at a considerable distance beyond the Hawásh. We now ascended nearly S.E., and again descended to the Mésel (whetstone) River, so called from the stones in its bed being used to sharpen knives, &c. At $3\frac{3}{4}$ P.M. we stopped near a village where we were detained $\frac{1}{2}$ an hour; and in $\frac{1}{4}$ of an hour after leaving it we reached the river Sanbállet, where we stopped for the night. The bearings of our route being given in the accompanying map, need not be repeated here. Our road to-day lay along the eastern declivity of the mountains: to the E. of our route the country continued to fall towards the Hawásh and the country of the Adál, or Danákil.

27th.—Left Sanbállet at $8\frac{3}{4}$ A.M., and proceeding northward crossed a small stream which forms a waterfall, nearly if not quite 200 feet in height, and afterwards continued winding along the

edge of precipices. The whole country is a mass of mountains. In about 1 hour we came to a fine view of the Adál country, lying flat, or seemingly flat, to the E. of our route. The forms of some of the intervening mountains were very remarkable: one in particular was perfectly conical, and looked more like an artificial mound than a work of nature. The road in parts was so bad that our mules could with difficulty find a practicable path. On our left was the range of Mount Wútti. We had now a long steep descent on foot, picking blackberries (not yet ripe) from the hedges as we went along. The sun being now to the N. is extremely perplexing to me, who am not accustomed to see it in that direction. Still descending, we passed at $11\frac{1}{4}$ the village of Aliu Amba (this is not the market-place of that name), the inhabitants of which are chiefly Moslems. We here saw a large plantation of capsicums, of which so great a quantity is consumed in Abyssinia. The surrounding country is rich and well cultivated; the Mohammedans being more industrious than the Christians and not having so many holidays. After stopping near Aliu Amba about $\frac{1}{2}$ an hour, we went down a steep descent into a valley, and at $12\frac{3}{4}$ P.M. we reached the river Arámba, which is at present about 10 feet broad and from 1 to $1\frac{1}{2}$ foot deep. Its course where we crossed it is nearly E. From this stream we ascended slightly, and then descended to the river Dánji, which is much larger, being from 15 to 20 feet wide and from 2 to 3 feet deep, and very rapid. We crossed the Dánji at 2 o'clock, and thence ascending northward in $\frac{3}{4}$ of an hour more reached the village of Korugússa, the residence of the Walasma (or *Moslem* governor) Mohammed Sheikh. Before reaching this place we passed through some extensive fields of cotton which was just beginning to blossom. Korugússa is situated at the foot of the mountain-peak Koremámmet. The hill is westward from the village, and beyond it is another called Kóru. The language spoken here is not pure Amharic, but the dialect of Argóbba, the same as is spoken at Férri. The two rivers we passed to-day, and a third, farther to the N., called the Shonkórgie, unite and form the Awádi, an affluent of the Hawásh. The Shonkórgie is said to come from Mount Tarmáber, the Dánji from Mount Wútti, and the Arámba from the village of Wórra Kottela (?), near Mount Emmámret. In the rainy season the Dánji is impassable.

28*th.*—Left at $7\frac{1}{2}$ A.M. and continued descending nearly in the direction of N. at first on ploughed land, then through a rich fertile valley along a lane with hedges on each side of honeysuckles and jasmine, which perfectly perfumed the air. The river Shonkórgie was before us, and the country around was beautiful. The ploughed land extends almost close to the river-side, to which the descent is gradual, whilst the mountain on the N. side falls ab-

ruptly to it. It is scarcely possible to fancy oneself in Africa. At 8¾ A.M. we reached the river Shonkórgie at the point where it is formed by the union of three streams, the Endótie, the Wansabérit, and another coming from the S.W. The bed of the Shonkórgie is very broad, and the water runs in a number of small channels. After crossing it we had to stop ½ an hour to repack our baggage-mule, and whilst thus delayed a heavy shower came on. It was surprising to see the almost instantaneous effect on the waters of the river; they came rolling down in one wave; and where we had just before passed without the slightest difficulty, a man who wanted to cross after us could not find a ford. We now proceeded up the valley of the Endótie, which rolled far below us between precipitous banks. At 9¾ A.M. we descended to the river, which had now, in consequence of the rain, become, as regards the body of water and the rapidity of the current, as large as the Dánji, at the time of our crossing it. The Endótie rolled along a muddy stream frightfully rapid, and we had to ascend its bed, which we did northward, crossing the stream repeatedly. At 10 o'clock we passed the church of St. Mary, on the E. bank of the river; the priests invited us to stop till the waters had abated, but the worst was now over, as the stream was getting less every moment, and we therefore kept on our way. At 10¼ A.M. we left the main stream, which here comes from the N.W., and went along the banks of a tributary. The country now became more open, and in ½ an hour more, having passed a small waterfall to the right, we ascended a steep, where we stopped to look around us. Close to us on the E. lay the village of Ka[illegible]ba, on a mountain of the same name; to the W. was Mount Tarmáber; and the higher portion of Wútti bore S. 25° W. We still kept ascending, and at 11½ A.M. came to the high land forming the water-shed between the Awádi and Róbi rivers. We now proceeded through a beautiful country of fertile meadows and fields of corn, with trees studding the whole, and hedges dividing it; in fact it was almost an English prospect, only that the hedges here are all of jasmine, roses, and honeysuckles in full bloom. A little after 12 we stopped near the village of Dokákit to let our mules graze in a beautiful meadow of grass and white clover. After resting for ¾ of an hour we proceeded, descending along the caravan-road, from Aliu Amba (the market) to Anthiókea. After crossing a couple of small brooks forming the river Adilék and continuing through meadows, we at 2 o'clock reached Abómsa, the residence of a governor, to whom our *affero* brought orders to furnish us with an escort, that we might first see what elephants were to be met with on the banks of the Róbi. *Fortunately* he was from home, and we therefore went farther, glad enough to be spared this useless delay. From Abómsa we de-

scended a steep, passed the village of Arábo Amba; and then, after going round a little way S.E., ascended (N.60° E.) to the residence of the Governor of Mákhfud, where we arrived at 3¼ P.M.: this is the Marfood of the maps. The village, or town, lies to the E. of the Amba, on which the Governor's residence stands, and the district bearing the same name extends to the E. The flies here (the common house-fly) are quite a pest; the swarms are numberless, and one is not a moment at peace for them.

29th.—Quitted Mákhfud at 6½ A.M., and, descending the Amba on foot on account of its steepness, we in ¼ of an hour mounted our mules and proceeded along a rich valley, of black soil, finely cultivated. Gradually the country became more barren; and as we approached the Róbi we passed over a mere waste. At 8 A.M. we crossed a small branch of that river, and, a few minutes later, the main stream, which was then about 15 feet wide, and from 1 to 2 feet deep. The stream winds E.N.E., through a broad flat valley. After crossing the river we traversed a wild plain, overgrown with shrubs and herbaceous plants, amongst which we lost our way; but at 8½ A.M., having crossed a deep ravine, the dry bed of a stream, we recovered it again. We now continued for a time nearly parallel with the course of the Róbi, through a wood of acacias, the thorns of which tore our faces, hands, and clothes. About 9 o'clock we crossed the dry bed of a larger stream than the former, after which the ground becomes more fertile, and begins to be cultivated. The mountains all fall to the N. and E. At 10 o'clock we left the proper valley of the Róbi, and went up a branch plain or valley, which becomes woody as we ascend; and in ¼ of an hour we came to a place which we were told was infested by robbers and murderers. That the wilderness (Gédem has this signification in the Geez) is the place of refuge for all the fugitives and bad characters of Shwá is a fact, but the danger is much exaggerated. The government of Shwá has its faults; but throughout the greater part of the dominions of the Negus a single traveller may pass unarmed with perfect safety. At 11 o'clock we crossed a large wady, and began to ascend through acacias, colqualls, and euphorbias; then, winding round the head of a glen, we at 12 o'clock reached the water-shed between the Róbi and the Saúor, and began descending into the valley of the latter river. In ½ an hour more we reached it. Its bed, which is very wide, is divided into several channels, the principal one being about 10 feet wide, 1 foot deep, and tolerably rapid. Here we stopped ½ an hour to water our mules, and to lunch. At 1 P.M. we began moving over the plain to the N. of the Saúor. About 1½ P.M. we crossed the A'shmat, about the same size as the principal stream of the Saúor; and, in ½ an hour more,

the Gashabakíndi. From hence we continued for ¾ of an hour over the plain, towards Felamba, our place of destination for the night; but hearing of some hot springs in the neighbourhood, we turned off for the purpose of visiting them; and after passing through some cotton-fields we at 3¼ P.M. reached the Gáua, about the same size as the A'shmat and Gashabakíndi. This stream we ascended a little way till we came to a division of the channel into two parts, when, having crossed the principal one, we stopped in the island formed by them to shoot Guinea-fowls, just as a shower of rain came on, when we saw, as on a former occasion, the waters come down in one large wave, raising the entire level of the river at least a foot as it descended. We now continued up the bed of the stream till 3¾ P.M., when we turned up a small water-course to the hot springs of St. Abbo and the Holy Virgin. The spring called after St. Abbo runs out of a grassy bank by a wooden spout, in a constant stream of probably 2 inches in diameter, and at a height which admits of persons placing themselves under it, to whom it serves as an excellent *douche* bath. The spring of the Virgin is on a lower level, and is therefore formed into a pool below the surface of the ground, in which the patients can immerse themselves. The water of both springs is so hot that it cannot be borne comfortably at the first moment: it is therefore probably of the temperature of 100°. Both Mr. Krapf and I tasted it several times, but could detect neither taste nor smell. It is said, however, that when drunk in quantities it is purgative. The offerings made by persons using the springs (which are quite voluntary) go to the governor of Felamba (*i. e. boiling* mountain). After remaining at the springs about ¼ of an hour, we began to ascend the steep Amba, from the foot of which these springs issue, which must be at least 1000 feet above the level of the Gáua. We were a full hour reaching the top, and arrived at 5 P.M. after a hard day's work.

30*th*.—Left Felamba at 9 o'clock A.M.; the road still ascending. To the N.E. lay the country of the Galla, tributary to the governor of the E'phiata, who are at present in a state of rebellion, in consequence of his having seized their cattle. We had an extensive view of the Galla and Adál country; but in consequence of the mists we could not distinguish objects. To the left of our road lay mountains, round which we kept winding, and between which the valleys formed almost perfectly funnel-shaped depressions. At 11½ A.M. the residence of the governor of Gédem bore N. 5° W. of us, and we stopped to fire a salute (as we usually did before arriving at our resting-places), and then proceeded; first descending into the valley below us, and afterwards ascending the Amba, on which it is situate. It is called Kók-Fára. E'phiata is said to bear due N. one day's journey; and

the river Bérkena, the boundary of the kingdom of Shwá, is another day's journey beyond E'phiata, which is, however, the last seat of government northward, the country beyond it on the frontiers of Shwá, towards the dominions of Béru, the ruler of Argóbba, being a wilderness like the valley of the Róbi and the Saúor. The province of Gédem lies to the E. and S.E. of this place, being in great part occupied by Gallas, tributary to the Negus.

May 1*st*.—The governor, who was from home when we arrived, did not return yesterday; and a messenger from him this morning says he will probably not be able to come till to-morrow. We begin to suspect the object of our being sent here. Should the governor of E'phiata not be strong enough for the rebellious Gallas, the governor of Gédem will have to assist him; and even though we do not take part in the war, our presence will intimidate the rebels. The governor of Gédem possesses four guns, three matchlocks, and one flint. The governor of E'phiata has only *three*. We have in all *eight* fire-arms. But Mr. Krapf and I have fully made up our minds under no circumstances to take any part in the conflict. I brought my sextant with me, in the hope of being able to ascertain the latitude of our various stations on the road; but it is quite out of the question, although I am up a great portion of the night, in case a clear moment should offer me an opportunity of observing.

2*nd*. (*Sunday*).—The governor arrived at 9 o'clock A.M.; Mr. Krapf has been so unwell that he has made up his mind to return without delay to Ankóber.

3*rd*.—Mr. Krapf a little better, but still unwell. He proposed that he should give up our intended expedition; but this the governor would not hear of. He had received orders from the Negus to accompany us into the wilderness, and accompany us he must and would. In the afternoon we descended to A'rsu A'mba, which we reached after a ride of 2½ hours: orders were immediately sent down to the Gallas to assemble for the purpose of escorting us, and at 8 o'clock the túltúllo, or hunting-cry, was given.

4*th*.—At 5¾ A.M. we started on our hunting expedition, accompanied by the governor and a considerable escort, and were joined on the road by large parties of his retainers and of Gallas, the latter mounted on small but spirited horses. When they approached the governor they set up a loud cry, and the chiefs dismounted and gave him their hands. The chiefs wore dresses of honour, given them by the Negus, consisting of pieces of blue and red woollen cloth, of about the size and shape of the sheep-skins which they usually wore over their shoulders, and of which these took the places. It would be of no use to relate how

we went on foot through the wilderness or forest on the banks of the Saúor, following after elephants, which, roused by the cries of our scouts and forerunners, gave us no opportunity of seeing them, although we had sufficient evidence of their proximity. At 1½ P.M., being heartily tired of our useless labour, we began our return. The governor had gone on before, but we soon came up with him; and before our escort left us we stopped to deliberate as to when our next hunting-party should take place. We wished much to leave, being perfectly convinced that, with 300 or 400 men scampering about the wood in all directions, and calling out at the height of their voices to one another, it was perfectly ridiculous to think the elephants would allow us to approach them. But the governor and the chiefs said they would be disgraced if they let us off in this way, and we were obliged to consent to come down again on Thursday morning. We now learned that the war with the Gallas was over, they having been defeated with the loss of *thirteen* men, the governor of E′phiata losing six.

5*th*.—Remained at A′rsu A′mba, where we were the greater part of the day surrounded by people, who came to see us and all the wonderful things we have about us.

6*th*.—Another day's fatigue, to no purpose; the people kept calling on us to follow, which we did through the rivers and swamps (now much deeper on account of the rain) until we were so heartily tired that we refused to go any farther: and we did not see a single elephant. Our escort went on to inform the governor, and now we had a chance; two elephants presented themselves to our view, but we did not get a shot at them. I mention these trifles because we intend to make them a reason with the Negus for allowing us to go to Búlga to see whether we cannot be more successful with a *small* escort. If he permit us, we shall see the south-eastern portion of the kingdom; which is of more consequence than shooting a score of elephants. Hearing that the governor was gone on, we proceeded to join and take leave of him; our baggage having been sent on this morning to Sébcha, where we intend resting this night. After crossing the Gáua twice, we came, about 2½ P.M., to the spot where we turned off from the road to visit the springs of Felamba, and soon after began to ascend, which we continued to do till 3½, when we reached a considerable town named ———,* belonging to the queen dowager, who has considerable possessions in various parts of the kingdom. Here we stopped at the governor's house to refresh, and were much pressed to remain for the night, but we declined; and, after ½ an hour, proceeded, still ascending. At 4¾ we went round a little way in the direction of

* The name is left blank in the MS.—Ed.

N., at the back (left) of the mountain we had ascended, and then returned S.W. from the head of the glen round another. We still kept ascending, but there was higher ground yet to the N.W. of us, as will appear from an inspection of the map. At 5 o'clock we passed Hángar, a market-town, and then proceeded W. and N.W., over tolerably level ground, passing the governor of Káot's residence, situated on a high mountain to the right. We next proceeded over swampy ground, formed by small streams falling from the mountains to the N. of us, the principal one being called the Mágana, which goes (as indeed they all do) to form the Gashabakíndi. After ascending the steep mountain W. of this stream, we, at 6 P.M., reached the house of the alaka of Sébcha, a friend of Mr. Krapf. The village of Sébcha is placed in a sort of *cul de sac*, formed by the surrounding mountains, standing, like all villages in this country, on a separate amba. The surrounding district is called Káot.

7th.—Our friend the alaka would not allow us to proceed this day; and as I did not like to leave the neighbourhood without a single observation, I was not sorry at his friendly detention. During the night I had the only *chance* of an observation in the whole course of the journey—an observation by the double altitude of the moon's lower limb when *close on the meridian* was 104° 28′; the index error of my sextant being 2′ 30″. This would make the latitude 10° 11′ N.; which, as it corresponds very well with Mr. Krapf's and my own dead-reckoning, may be taken as the probable latitude of Sébcha. The clouds prevented me from observing the *exact* meridian altitude; and every other night has been too much overcast to admit of observations.

8th.— Left Sébcha at 6½ A.M., and kept ascending the mountains behind it. In ¼ of an hour we reached a small waterfall, which we crossed, and then went over level ground to a second, which we passed ¼ of an hour later. After a further steep ascent of ½ an hour we reached a point where we had a prospect behind the mountain (to the N.E.), as well as to the front. Still ascending, we reached, in rather more than another ¼ of an hour, the sources of the river Jákana, which flows to the N. of Kók Fára. Before us was another range of mountains. After proceeding for some distance, nearly on a level, we, at 8½ A.M. crossed the head of a valley, and a stream running to the S.E. to join the Gashabakíndi, and then, ascending round a mountain to our left hand, we, in ½ an hour more, reached a level plain, in which is the water-shed between the Abái and the Hawásh. Our road now lay along this plain, which is a swampy moor, with low mountain-peaks on either side. The elevation must be greater than that of Ankóber, if I may judge by the temperature and the vegetation, which consists almost exclusively of low firs, heaths, and ferns. The air was exceedingly bleak and cold At 9 A.M. we

crossed the sources of the Mófer flowing S.W. to the Abái; and, in ½ an hour more, those of the Gashabakíndi, flowing to the Hawásh; whilst, in another ¼ of an hour, we came to those of a stream joining the Mófer. At 10½ A.M. we came to the sources and descended the valley of the Gift, flowing S.E. to the Abái; we left it on the right, and came to another stream running in the same direction. Continuing our route, over ground all springy and swampy, we soon after, 11¼ A.M., emerged on the *eastern* side of the range, arriving at the sources and over the valley of the Saúor. The difference of temperature was here very remarkable: the passage from the bleak cold moor into the sunny valley of the Saúor was almost like going into a different climate. We now continued for some length of time crossing numerous streamlets, all affluents of the Saúor, the sources of some of which were seen bursting through the sides of the mountains, whilst others came from above, forming small waterfalls. At 1½ P.M. we descended by a steep winding path into a beautiful broad valley, extremely fertile and thickly peopled; forming a portion of the drainage basin of the Róbi. Here, after crossing a few small streams, we ascended, winding to the head of another valley, through which flows the largest of the streams which unite to form the Róbi. We now continued winding and crossing several streamlets, and, at 4 P.M., reached the village of Tábor.

9th.—Left Tábor at 6¾ A.M., going at first over meadow and marsh land, and then ascending till about 7¾, when we passed round the side of the mountains and came into the valley of the Workwásha river, flowing to the Abái. The weather was too misty to allow us to see anything at a distance: however, from an eminence to the N.E. of our road 'Anthiókea was pointed out to us, bearing N. 10° E.; and Géshe, N. 5° W. A lake, called Alo Bahr, was said to be in the direction N. 35° W, which, from the accounts given of it, would appear to be of volcanic origin. A small lake is placed nearly in this position in Arrowsmith's map, which is doubtless the same, as we are now very near the route of the Portuguese missionary Olivarez, from whom, I apprehend, the account of it has been obtained. At 9 A.M. we proceeded a little way up the bed of the Workwásha, which, with its sources, we soon left on our left-hand, crossed the head of another small stream, and then the river Dífdif, coming from the E. At near 9½ A.M. we crossed a larger stream, and ascended by its side through swampy ground; and, at a little distance farther, crossed some pools forming the source of another stream. The pass of Tarmáber was now on our left, bearing S. 60° E. As we had now reached the high road to Angolálla and Ankóber, we met a number of people: having hitherto, on our road from the

N., met only a few occasional herdsmen of the Negus. Even here, however, the country is devoid of villages and trees, the mountains above being pasture, whilst in the valleys the ground is subjected, but in no very great degree, to the plough. Soon after 10 A.M. we came to the valley of the river Gur, a fine piece of arable land. We next came to the river Imbeláber, which runs to the N.E., and which lower down in its course receives the name of Beshkáli.* Continuing our way over a plain and crossing another small stream, we ascended a steep for a short distance, and then descended to the Jibwásha, which we crossed at 11½ A.M., just at the junction of the two streams by which it is formed. From this river we ascended for ½ an hour, crossed the valley of another stream, and then, after passing a village, the name of which we could not learn, but where we were informed there was a church dedicated to St. George, we descended rapidly to the river Gudoberát, which we crossed soon after 1 P.M. From it we ascended the steep side of a mountain, passing by an enclosure which to our eyes looked like that of some ecclesiastical edifice. We inquired of some passers-by whether a monastery was not there, and they answered in rather a confused manner that there was not. We afterwards learned that there was a monastery there, and suspect that the persons of whom we inquired on the road belonged to it, and told us a falsehood, lest our large party should have felt inclined to stop and demand the hospitality of its inmates. From its general position and its vicinity to the Church of St. George's, we imagine that this is the monastery of St. George's which appears on the maps. We now proceeded on a level till near 2½ P.M. A severe cold which I caught during the night at Tábor (the place we were given to sleep in being quite exposed to the weather), added to the effects of tramping about the moors and swamps at Gédem, rendered me too unwell to continue our journey. After proceeding therefore a little farther, we turned off to the village of Lagáita, where we arrived at 3½ P.M., and stopped for the night.

10*th*.—In the morning I was afraid I should not be able to proceed to Ankóber, but as Mr. Krapf was anxious to get home I was persuaded to make the attempt. We left Lagáita at 8¼ A.M. After passing through some marshy meadows and crossing a small stream Mr. Krapf pushed on before, leaving me in charge of the servants to follow at a gentler pace. At 9¼ A.M. I crossed the river Gunagúnit, and then ascended above the side of the stream, beyond which lay the large village or town of the same

* Or Beshkáti: the MS. is indistinct. Can this be the Bashelo, which, according to information received by Rüppell (vol. ii. p. 216), joins the Nile three days' journey to the S. of its confluence with the river so named on the map of Combes and Tamisier?—Ed.

name, situated in the fork of two streams. The road was now a succession of ascents and descents, but on the whole kept rising, till at 12½ P.M. I reached the highest point, being the water-shed in this direction between the Abái and the Hawásh, when I began descending along the side of Mount Chákka, having the river Airára far below in the valley. The road soon became so precipitous and bad that I was obliged to dismount and descend on foot in the best way I could, supported by two men. At 1¾ P.M., having come to the river, I remounted my mule and then ascended gradually on the other side, till at about 2½ P.M., when, turning short round to the E., I came to the Chákka market-place, and my eyes were greeted with the sight of Ankóber. In ½ an hour more I was at home.

The accompanying map will show our route more in detail; and on the margin of it I have noted the temperature at which water boiled at all our stations except Lagáita. I have not attempted to fill in any of the mountains beyond the central range of the Wútti, as in a country like this, which is altogether mountainous and where every mountain peak has its separate name, the attempt would lead to endless confusion.

This little excursion has been attended with the advantage of determining the position of the water-shed, in Southern Abyssinia, between the rivers flowing westward to the Abái and eastward to the Hawásh. As the longitude of the water-shed in this direction corresponds very nearly with that of the water-shed in northern Abyssinia, it may perhaps be not unreasonable to infer that they are both formed by a continuation of *the same* central high land; in which case it will follow that the sources of the river Takazze will be nearly in the position assigned to them in Arrowsmith's Map of Nubia and Abyssinia, and not so far E. as they are placed in Mr. M'Queen's Map of Africa, or in the little sketch which you forwarded me in a letter of the 4th of February last.* This is merely my inference from the premises, and it must of course bend before *evidence* to the contrary.

As far as Mr. Krapf has been able to ascertain, Lake Yuái† does *not* give rise to any rivers flowing *southward:* whether its waters join those of the river Hawásh, as shown in the old maps, is uncertain; but at all events the distance between the lake and the river cannot be very considerable.

The name "Gorror" would appear to have arisen from some misunderstanding of Messrs. Isenberg and Krapf, which they

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* The sketch published in the London 'Geographical Journal,' vol. x., to illustrate the route of Messrs. Krapf and Isenberg.—Ed.

† The name is written thus (or perhaps Zuái) in Dr. Beke's MS.: the lake here mentioned appears to be the same called Swái in the Society's Journal, vol. x. p. 481.—Ed.

afterwards corrected. The old name Hŭrrŭr is the name used by the Arabians and Danákil, and I believe also by the natives themselves. The Abyssinians say "Harrárge," which name (Harárgue) will, I believe, be found in the earliest maps, which were formed from the information obtained by the Portuguese in this country. As to the river made to flow past Hŭrrŭr, I imagine that is the remains of the *Portuguese* Hawásh, and that it has no existence in reality.

In conclusion I cannot avoid adverting to a name which appears in your sketch. Bruce prided himself in the idea that he had visited and described the sources of the Nile: we now know this to be merely a fancy of his own, for the true sources of that great river must be sought for far to the W. In Abyssinia the name *Abái* alone is known, and I trust that, in all future maps sanctioned by the Royal Geographical Society, that name will appear instead of the "Nile," or "Blue Nile," a designation which only serves to perpetuate error.

APPENDIX TO DR. BEKE'S PAPERS ON ABYSSINIA.

I.—List of Instruments.

In a postscript to his communication of the 12th June, 1841, Dr. Beke gives the following list of the instruments and books of reference which he had with him at the time. It is printed here from an idea that it may help in forming an estimate of the confidence to be reposed in his observations and calculations, as embodied in his narrative and map, and in the two following Tables:—

Sextant and artificial horizon.
Azimuth compass.
Pocket ditto.
Two thermometers (now both broken).
One ditto for determining heights by temperature of boiling water.
Pocket telescope (for general use).
Camera lucida (occasionally used: I have made two or three sketches with a 50-feet tape).
A good pocket watch.
Spring balance.
Two small compasses in wooden cases (intended hereafter for presents to natives).
Case of mathematical instruments.
Box of colours.
Ruled paper for maps.
Nautical Almanac for 1840-41-42.
Noric's Epitome of Astronomy and Navigation.
Jackson's Military Surveying.

II.—Observations on the Road from Tajúrrah to Shoa, 1840-41.

Date.	Place of Observation.	Meridian Altitude.	°	′	″	Thermometer (Astronom. Day.) In Shade. Noon.	In the open Air. 6 P.M.	About Midnt	6 A.M.	In boiling Water.	Remarks.
1840. Dec. 25	Hanlifáuta . .	☉	109	27	0	91	—	—	73 }	213¼	Water boiled on the shore close to Lake Assal. The water of the lake only *simmered* at 216°. The wind rose daily from the S.E. about noon, and continued till into the night, but about the middle of the month of February it shifted round to the N.E. The days throughout fine, with rarely any clouds. The nights as follows — 28th, dew; 29th, dew; 30th, cloudy, little or no dew; 31st, dew. 1st January, little or none.
26	Ditto . . .	☉	109	29	0	91	—	—	— }		
27	Gungúnta . .	—		——		91	83	77	74	—	
28	Allúlli . . .	☉	109	55	0	91	83	76	72 }		
29	Ditto . . .	—		——		90	82	77	73 }	211⅝	
30	Ditto . . .	☉	110	8	0	92	84	78	74 }		
31	Gágade . .	☾	110	22	0	91	82	72	63	211¼	
1841. Jan. 1	Ungamárra . .	☉	110	37	15	89	80	72	66 }	211 1/16	Little dew.
2	Ditto . . .	☉	110	49	0	90	81	74	71 }		
3	Dalibúi . .	Sirius.	124	22	30	91	82	64	61	211	Heavy dew.
4	Hái . . .	☉	111	31	45	91	80	64	61	210	Little dew.
5	Ab'áitu . .	☉	111	51	30	87	80	60	54	210¼	Clear and dry.
6	Abu Jússuf . .	☉	112	19	0	88	79	67	62	209 15/16	Ditto.
7	Sabólla . .	☉	112	48	15	90	82	64	60	210 1/16	Dew.
8	Arabdyrra . .	☉	113	13	45	92	83	70	65	209¼	Ditto.
9	Butta'éla . .	☉	113	28	30	88	80	68	62	209¼	Heavy dew.
10	Dauaileka . .	☉	113	48	15	85	80	69	64	209¼	Little dew.
11	Marahánni . .	—		——		85	78	70	67	209 11/16	Dry.
12	Am'ádu . .	☉	114	28	30	86	80	69	65	209¼	Little dew.
13	Fiála . . .	—		——		85	80	68	64 }		Ditto.
14	Ditto . . .	—		——		85	80	65	62 }		Ditto.
15	Ditto . . .	☉	115	39	0	86	79	64	61 }	208 15/16	Heavy dew.
16	Ditto . . .	☉	116	3	0	86	80	68	62 }		Ditto.
17	Barudydda . .	—		——		—	82	67	61	208½	Ditto.
18	Killelámo (*above* Killelu) .	—		——		—	84	67	57 }	208⅝	Ditto.
19	Ditto . . .	—		——		—	84	67	59 }		Ditto.
20	Horíssamadága .	Sirius	126	12	0	—	82	62	52 }	207⅞	Ditto.
21	Ditto . . .	☉	118	48	45	86	82	62	54 }		Ditto.
22	Gyrte'ába . .	Sirius.	126	19	0	—	78	62	59	207	Ditto.
23	Gabólli . .	Sirius.	126	32	30	—	83	67	61	208?	Little dew.
24	A'rolof . .	Sirius.	126	49	30	—	81	67	64 }	208¼	Cloudy; no dew.
25	Ditto . . .	☉	121	18	0	83	80	66	58 }		Ditto.
26	Adoléi . .	☉	122	3	0	} 84	78	65	55 }	208⅜	Ditto.
		Sirius.	127	3	0						
27	Ditto . . .	☉	122	34	30	83	74	61	49 }		Little dew; cloudy.
28	Buddicoma (*M.* Baddi)	—		——		—	75	59	48	208	Very cloudy.
29	Márro . . .	☉	123	54	45	85	74	—	67	207⅞	Little dew; cloudy.
30	Múllu . . .	☉	124	33	30	84	78	69	59 }	207¾	Ditto.
31	Ditto . . .	—		——		87	81	70	60 }		Ditto.
Feb. 1	Séik "Otban . .	Sirius.	127	32	30	—	80	69	60	—	Ditto.
2	A'u . . .	Sirius.	127	38	30	—	82	73	63	—	Ditto.
3	Dybhkm Sei .	Sirius.	127	45	0	90	—	—	—	207¼	——
20	Angolálla . .	Sirius.	127	45	0	—	—	—	— }		No rain fell on the journey until the morning of the 5th February, just before reaching Fárri. Since then there has been rain almost every day; at first in considerable quantities, but afterwards gradually decreasing. On the 21st and 25th February hail-storms; on the latter day very heavy. On the 21st I measured several hailstones three-eighths of an inch in diameter, and on the 25th many were full half an inch.
21	Ditto . . .	Sirius.	127	47	0	—	—	—	— }	196	
22	Ditto . . .	☉	139	50	30	—	—	—	— }		
24	Ditto . . .	☉	141	18	40	63	—	—	— }		

All the observations of meridian altitude were made with an artificial horizon. The sun was observed with shades, with which the index error of the sextant was at Tajúrrah +2′ 15″; but at Angolálla it was found to be +3′. Sirius was observed without shades, and at Angolálla the index error of the instrument was 2′ 30″. It had not been ascertained previously to my departure from Tajúrrah.

III.—Register of the Thermometer at Ankóber, March, 1811.

Day.	Noon.	6 P.M.	About Midnight.		6 A.M.	Remarks.
			Time.	Range.		
1	—	—	—	—	—	The *astronomical* day is used.
2	—	—	—	—	—	
3	—	57	12	48	—	
4	—	—	—	—	—	
5	—	—	—	—	—	
6	—	—	—	—	—	
7	—	57	10½	53	49	
8	—	57	11½	49	47	
9	63	57	13¼	53	50	
10	63	56	13½	50	—	
11	59	55	11½	49	48	Thick fog from the E. 10 A.M., which
12	62	55	13	50	48	lasted till past noon.
13	61	55	13½	50	48	
14	61	56	12½	49	47	
15	62	55	—	—	—	
16	61	58	15	51	—	
17	56	51	11¾	51	51	10 A.M. heavy rain for above 2 hours,
18	64	58	11	53	50	and again 3½ P.M. for a short time.
19	62	58	13	49	50	
20	64	56	—	—	48	
21	56	56	12½	50	47	11 A.M. thick fog from E., and it
22	61	56	11¼	51	47	continued overcast the whole of
23	62	58	12¼	53	—	these two days.
24	60	57	13½	54	51	Slight rain 9 A.M., and afterwards fog,
25	60	57	13	51	49	which continued all day and night,
26	63	57	12	52	49	and next morning very thick. Rain
27	62	57	13¼	54	51	from 9 till 11 A.M. Thunder and
28	61	57	11	54	--	lightning during night of 25th, and
29	64	58	14	52	48	slight shower next morning. It con-
30	65	58	13½	53	50	tinued overcast the next two days.
31	65	59	11½	54	52	

VII.—*Ancient Sites among the Baktiyari Mountains.* Extracted from a communication by A. H. Layard, Esq. With Remarks on the Rivers of Susiana, and the Site of Susa, by Professor Long, V.P.

Karack, December 31, 1840.

I have succeeded in reaching and examining Susan and some other places of interest in the Baktiyari mountains, to which the attention of the Geographical Society was drawn by Major Rawlinson. I left Ispahan in the middle of last September, in company with Schiffeer Khan, a Baktiyari chief, and reached Kala Tul by a road through the mountains, having crossed the highest part of the great chain of Mungasht. The road we followed is not the Yadahi Atíbeg, mentioned by Major Rawlinson (Geo. Jour., vol. ix., p. 83); that road we were unable to take on account of a blood feud existing between Schiffeer Khan and a tribe of Baktiyari.

My first expedition, on reaching Kala Tul, was to Manjanik. The description given by Major Rawlinson, derived from oral information, of these ruins is far from correct. I visited them on two or three different occasions, and can safely say that there are no mounds of any consequence. There are, indeed, the ruins of a city of some extent; and as these ruins resemble those of the Sassanian cities which I have seen, they probably are of that period.* The tradition mentioned by Major Rawlinson certainly attaches to the place; but the mound described to him is very insignificant.

The Abi Zard, which flows in the midst of these ruins, unites with the Abi Allah, a very considerable stream, much larger than the Abi Zard, flowing from the mountains of the Kongelon tribes, its source being near Kala Allah. The united rivers, retaining the name of Abi Allah, flow into the Kurdistan, in the plain of Ram Hormuz.

The plain of Mel Amir contains ruins of two descriptions, the ancient mound and the Sassanian ruin. There are also several cuneiform inscriptions in the neighbouring mountains. The Shikafti Salmán, mentioned by Major Rawlinson, is to the W. of Mel Amir, and not on the road to Susan. Adjoining the natural cave, are four tablets with sculpture; and there formerly existed extensive cuneiform inscriptions, one of which only I was able to copy; the others are completely effaced. The sculptures appear to me to be of a very ancient date, and the character used in the inscription is very complicated. Two colossal figures appear to represent priests of the Magi; between them is a natural recess in the rock, which may have been used as an altar. In the same plain, and on the road to Susan, there are other sculptures, and very extensive inscriptions, which I have not yet had time to copy. The plain is called Hong.

The plain of Mel Amir is separated from the valley of the Kuran by a ridge of hills of a considerable height. There are two roads across these hills to Susan. The distance may be between 15 and 20 miles. I had much difficulty in reaching Susan, the neighbourhood of which is inhabited by a tribe of the Dmaruni, notorious for their predatory habits. Unfortunately I was robbed on my way thither of my watch, compass, and many other things which would have proved exceedingly useful to me.

I have experienced the difficulty of obtaining correct information as to things and places from Persians; and I am not surprised that Major Rawlinson should have been misled by their exaggerated accounts. At Susan there are scarcely any remains which would indicate the site of a large city; and those ruins which do actually exist are all confined to the northern bank of the river. I do not doubt, however, that a large city did once

exist here; but there are no mounds of any size, or columns, or even hewn stones and bricks. On either side of the river, which enters and leaves the valley of Susan by narrow and almost impassable gorges, there are the remains of ancient roads, and the river was formerly spanned by a bridge, four buttresses of which remain and attest the stupendous nature of the building. The tomb of Daniel is neither of white marble, nor are there any sacred fish: it is a comparatively modern building, of rough stones, containing two apartments. It is regarded with great veneration, and is always known by the name of Gebr Daniel Akbar, or the Greater Daniel, in contradistinction to the one at Shus. There is an inscription near the tomb, which, however, from the extreme jealousy and suspicions of the people, I was unable to see. The story of the black stone of Shus had reached them, and they conceived that I wished to carry off their talisman. I trust, however, to be able to visit the place under more favourable auspices. The river Kuran is here a fine broad stream, the water of exquisite clearness, and remarkable throughout the country for its good qualities. I found it fordable in one place only.

I hear of another place called Susan, in the mountains, to the N.E. of the place I visited. There are also here, I am told, the ruins of a large city, and adjoining a very extraordinary work: a mountain known by the name of Koh Kai-kou is said to have been cut through to afford a passage for a considerable stream, which formerly formed a lake. I am also informed that there are numerous cuneiform inscriptions in the neighbourhood. Making considerable allowance for exaggeration, it is probable that there are ruins and works at this place worthy of a visit. This Susan is known as Susan Sir Aub, to distinguish it from the other place of the same name, and is situated upon a considerable stream running into the Kuran.

Professor Long's Remarks.

Major Rawlinson admits Sus, near the Kerkhah or Choaspes, to be the Susa of the Greeks; yet he contends that the Shusan of Scripture is a different place, and was situated on the river of Shuster, higher up than Shuster, and in the mountainous country. But before finding a site that shall represent this Shusan, it is necessary to show that Shusan is different from Susa. Major Rawlinson's arguments are stated in this Journal (vol. ix., p. 85), but in my opinion they have no weight. There is not the slightest evidence to support the notion of Shusan and Susa being different places; and it now appears from Mr. Layard's visit to Susan on the river of Shuster, that there are no mounds of

any size, and that the supposed ancient tomb of Daniel is a comparatively modern building. Mr. Layard thinks that a large town has existed at Susan; but there is nothing to show that it was Shusan. Even if the ruins at Susan exactly corresponded to Major Rawlinson's description, I should not think his argument at all strengthened by that fact; for he has failed to show that Shusan is different from Susa, which must be done before we look out for a site for this new Shusan.

The general state of the comparative geography of Susiana, as respects the site of Susa and the rivers of Susiana mentioned by the historians of Alexander, may be collected from my paper on the site of Susa, in this Journal (vol. iii., p. 257). There is some confusion in the historians of Alexander and in those who copied them, as to the rivers of Susiana, which does not surprise us when we know the nature of the country. Major Rawlinson's theory of the rivers is this: the Kerkhah or Kerah (as it appears to have been hitherto incorrectly called) is the Choaspes, the river of Dizful is the Coprates, the Kuran above Shuster is the Eulæus, and the united arms of the Kuran and the Dizful rivers make the real Pasitigris. My theory is this: the Kerkhah is the Choaspes, the river of Dizful is the Coprates, the Shapur, which flows along the western base of the great mound of Sus, is the Eulæus, and the united stream of the Shuster and the Dizful rivers is the Pasitigris, which, at least below the junction of the Shapur and Kuran, was often called the Eulæus. The river of Shuster I leave without a name, as the best Greek writers have left it. Diodorus calls it the Tigris or Pasitigris, and, whatever may have been its real name, this is the river spoken of in the campaign of Eumenes and Antigonus. I admit that there are difficulties in identifying the ancient rivers of Susiana, but my theory presents fewer than any other.

Major Rawlinson first undertakes to establish that Shusan is different from Susa. His argument to prove this is stated at p. 85. He has next to find a site for this Shusan, and he fixes it at Susan on the Kuran; but the site does not correspond to his description obtained from hearsay. His argument, then, is reduced to this, that the expression "Shusan the Palace," would appear indicative of a distinction from some other city of the name; to which I reply, that such an expression may very well be used without implying any such distinction. Major Rawlinson has then neither established the fact of Shusan being different from Susa, nor has he found a place for this assumed city.

Major Rawlinson finds no difficulty in reconciling his theory of the rivers of Susiana with the ancient geographers and historians, except as to one fact mentioned by Diodorus (xix. 17) in his history of the campaign of Eumenes and Antigonus. Anti-

gonus arrived on the W. bank of the Coprates, and Eumenes was E. of the Pasitigris. Eumenes re-crossed the Pasitigris and defeated Antigonus,* who retired to Badaca on the Eulæus. Now he might very well retire to a place on the Shapur (which I assume to be the Eulæus), but he could not retire to the river of Shuster, the Eulæus of Major Rawlinson. Either, then, the river of Shuster is not the river of Diodorus, or Diodorus has made a mistake as to the Eulæus. Major Rawlinson would willingly consider the mention of the Eulæus in this passage to be an error. He says that "in describing the march of Alexander from Susa to Ecbatana, Diodorus had previously mistaken the Choaspes for the Tigris, (p. 91)† and this second error need not therefore so much surprise us." Because then he has made one error in the geography of Susiana, we must assume that Diodorus has made two; and by the same reasoning, two being established, we must assume a third, and so on. It would be better to reject the evidence of Diodorus altogether as to Susiana, than treat it in this manner, and to determine the question by other evidence.

The river Shapur, here assumed to be the Eulæus of the historians of Alexander, rises, according to Major Rawlinson, "about 10 miles N. of Sus; it flows in a deep narrow bed by the tomb of Daniel, and laves the western face of the great mound." Near the mound there is a ford, the only one in the river, as Major Rawlinson was informed, from near its source to its junction with the Kuran. Major Rawlinson adds, that the Shapur is navigable from Sus to the junction of the Kuran, and "from the facility which its deep and narrow bed, nearly level with the

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* Major Rawlinson says, "Eumenes re-crossed the Kuran when a part only of his adversary's forces had been passed over, and, attacking them before they could be supported, he gave Antigonus a signal defeat." Major Rawlinson supposes that Eumenes on retiring from Susa crossed the Kuran below the confluence of the Dizful branch: and he appears to consider that he re-crossed it at the same place. If so, he attacked Antigonus on the W. bank of the Coprates. But this is not the fact, according to Diodorus, who means to say that Eumenes attacked a part of the army of Antigonus which had crossed the Coprates, and Antigonus, for want of boats, could not help them, being on the W. bank. The narrative of Diodorus is very confused; but this is the meaning of this passage. The words of Major Rawlinson also are not free from ambiguity.

† The reference in the 'Geographical Journal' is "Diodorus xvii. 11;" but I assume that this is a typographical error, and that it should be "xvii. 110;" in which passage Diodorus says that Alexander left Susa, and, crossing the Tigris, encamped in Caræ. From Caræ he passed through Sambana, Celonæ, Bagistana, and arrived at Ecbatana in Media. When we have discovered the exact route of Alexander we may then determine whether Diodorus has mistaken the Choaspes for the Tigris: with our present knowledge of the country it would seem as unnecessary to cross the Choaspes as the Tigris or Pasitigris. It might also be suggested that the error in Diodorus, if it be one, is an error of the copyist; and it might also be suggested that Diodorus, if the reading is right, simply copied his authority here, as he does elsewhere, without understanding it. It is not too much to assume that Diodorus did not know the geography of Susiana, and that he simply copied his authorities, whether they were right or wrong. Consequently an error in one instance does not authorize us to assume error in another.

surface of the plain, affords for draught, is particularly suited to navigation." This river, which is navigable, was navigated by Alexander, according to Major Rawlinson.

The passage of Arrian (Anabasis, vii. c. 7) is referred to by Major Rawlinson (p. 90) to show that, on his return from his eastern expedition, Nearchus brought the fleet "to the mouth of the Shapur river; and from hence he navigated that stream to Susa." This is not the meaning of Arrian, who says that Hephæstion brought the fleet up into the Susian territory (Σουσία γῆ), and that Alexander embarked and sailed down the Eulæus to the sea. Major Rawlinson has it thus:—"Alexander afterwards embarked on the Shapur, and following the course of it to the great river, sailed down the Eulæus (as we should say, at the present day, he sailed down the Kuran) to the sea, sending his shattered vessels through the Hafar cut into the Tigris." Now if the fact were as Major Rawlinson represents it, he would have shown most clearly that the Shapur is the Eulæus; which he does not intend to do. The fact, however, is, that this passage only proves that Alexander embarked on the Eulæus somewhere in Susiana, and thus reached the sea. But this passage proves that the Pasitigris was sometimes also called the Eulæus, which is intelligible enough if we assume the Eulæus to be the Shapur.* Alexander may have embarked at Susa; but Arrian does not say so. (See Geographical Journal, vol. iii., p. 258.) There remains a difficulty to be stated as to the identity of the Eulæus and Shapur. "The water of the Shapur," says Major Rawlinson, "is considered by the Persians to be particularly heavy and unwholesome, and in this respect to bear a striking contrast to the Kerkhah, which flows at some distance to the W., and is believed to be little inferior to the Kuran in the lightness and excellence of its water." Also the river Kerkhah is 1½ mile to the W. of the great mound of Sus, and Major Rawlinson could discover no trace of building in the interval between the rivers. The great mound, as already observed, is on the E. bank of the Shapur: now if the Shapur is the Eulæus, and if the water of the Eulæus was famed for its quality, we have a contradiction; but the solution of the difficulty, if it is considered such, is that the Eulæus has been confounded with the Choaspes from their proximity. Further, there are no ruins except on the E. bank of the Shapur, and none on the Kerkhah, and yet the Kerkhah is admitted to be the Choaspes, and Susa was on the Choaspes; therefore Sus is not Susa. Here we have another contradiction; but the answer is this: the Choaspes and Eulæus, from their proximity, were often

* And it is proved by a comparison of Strabo with Arrian, that the names Pasitigris and Eulæus were sometimes used indifferently. (See Geog. Journal, vol. iii. pp. 258, 259).

confounded. If this is not admitted, then if Sus is Susa, the Shapur is the Choaspes, and thus all is thrown into confusion. But the easiest solution of the difficulty is that already mentioned, that owing to their proximity the two rivers have been confounded, and the site of Susa has been referred generally to the larger stream. Beside this, it is possible that there may have been buildings between the Shapur and the Choaspes. Indeed such a position between the two large streams must have been a very strong one, and if there is no doubt of Sus representing Susa, and I do not doubt it, I venture to assume that the mass of the city was between the two streams; and the citadel, if the mound represent it, would be on the E. side of the Eulæus. And if this citadel represent the royal residence, for which it would do very well, then the prophet Daniel, to use the words of Major Rawlinson, being in the palace, might see the vision on the borders of the Ulai (the Shapur) and hear the voice between the banks of the river; for, to apply the words of Major Rawlinson to this site and mound which he applies to the imaginary mound of Susan:—"At Sus the river does actually lave the base of the mound;" and at Susan, the mound, instead of being 1½ mile distant from the river, on which Major Rawlinson founds an argument against the identity of Susa and Susan, does not exist at all.

I say nothing as to the evidence of Ptolemy, which Major Rawlinson has used in his argument. I do not understand the passage in which he speaks of Ptolemy (p. 85); and I do not admit that Ptolemy's evidence, even if rightly understood, is of any use for settling this question. I lay no stress on Pliny's account (lib. vi. c. 27). It is too confused to be urged as evidence on either side; but, if it is to be evidence, I claim the benefit of it. Pliny mentions the Choaspes distinct from the Eulæus; and he says that the Choaspes falls into the Tigris. He describes Susa as an ancient royal residence, built by Darius, the son of Hystaspes: but he does not add on what river it stands. He says, however, that the fleet of Alexander reached it from the sea by navigating the Pasitigris up to a certain point called Aphle "whence Susa by navigation is 65 miles distant." According to this, the Pasitigris was navigated to Aphle from the sea, and then a new navigation commenced along some river which has no name given to it. When Pliny speaks of the Eulæus he makes it the boundary of Susiana and Elymais, a description which does not well suit the Shapur; and he further describes it as receiving the Hedypnus and a river from Susiana; which only increases the difficulty. If we assume, with Major Rawlinson, that Pliny is speaking of the Kuran and its affluents, Major Rawlinson himself suggests a difficulty. Pliny says that the Eulæus rises in Media and traverses Mesobatene. Now Major Rawlinson iden-

tifies Pliny's Mesobatene with Máh-sabadán, and, he adds, "the Eulæus which traversed this district above Susiana can only represent the Kerkhah; and yet, in his (Pliny's) further notice of the river, the Kuran will alone answer the description." Pliny further says that the Eulæus surrounds the "Arx Susorum" (Susiorum or Susianorum?), which Major Rawlinson does not consider to raise any objection to his theory of Shusan being on the Shuster river. He says, "when again he (Pliny) states that the Eulæus surrounds the citadel of Susa, I cannot but recognise the Kuran and Susan; for, as I have shown, the Kerkhah flows at the distance of 1½ mile from the great mound of Sus." But as we now know that there is no mound at Susan, the matter is reduced to this:—part of Pliny's description of the Eulæus is applicable to the Kerkhah, and part is applicable to the Kuran. A better proof of the worthlessness of his evidence could not well be urged.

I am not aware that any facts as to the rivers of Susiana have been established since the publication of Major Rawlinson's paper, which can throw any new light on this question. If we are now rightly informed as to the general course and position of the Kerkhah, the Shapur, the Dizful river, and the Kuran, we know all that is material for the question.

VIII.—*The Bolan Pass.*—Extract of a Letter from an Officer of the Bengal Artillery, dated Camp at "Quetra," or, more properly, "Shawl Kot," in Khorasan, 2nd December, 1841.

AFTER crossing the desert from Sukkur, by way of Barshore, we drew near the range of mountains that divide Sinde, Kachu, and Gundova from this pass. They are beautiful and varied in form, but rocky and precipitous, devoid of vegetation, except that in the ravines and water-courses a few stunted bushy trees are to be observed. The Bolan river runs along the base; and in the neighbourhood of this stream cultivation is again to be met with.

This brings me on to Dádar, from which place I took my departure on the 16th November, having with me about 500 camels and eight carts and waggons. The road through this pass leads, with few and rare exceptions, along what is the bed of a mountain-torrent, when filled by the melting of the snows or heavy rains, and is composed of loose shingly gravel, that recedes from under your feet, and is very difficult for draught: camels get on well. It is infested by the Kakurs, who live by robbery; and the hills sometimes close in upon the road, which is filled up by the bed of the stream, running through rocky chasms, up-

wards of a hundred feet high, from the top of which the robbers assail the traveller with stones; and were they as bold as they are cruel and perfidious, they might hold the place against all comers. Many spots were pointed out to me by the guides I had with me, as signalised by acts of violence, several European officers having lost their baggage during our occupation of the country. Should there be rain in the higher parts of the mountains, the stream at times comes down in an almost perpendicular volume, without warning, and sweeping all before it, as a friend of mine experienced, when he saw a party of men, horses, and camels, and all his property, borne down by it; when himself and some few men with him escaped by climbing up the nearly perpendicular side of the hill. About thirty-seven men were washed away upon that occasion. The views in this pass are grand, but there is a want of contrast to the barren rocks.

In the second march through it we had to ford the stream eighteen times; tedious work, as the men must unshoe, and put their shoes on again after crossing. At the halting-place the country opens out into a large valley, about 10 miles long, by 3 or 4 broad, having the Bolan river foaming along the base of the hills on one side. Here is a small village, and near the bank of the river the soil improves; some traces of cultivation are seen, and forage is obtainable for our beasts.

After making a short halt in this valley for a reinforcement, I moved on through an open and stony, barren plain, surrounded with mountains; a low rocky ridge of hills runs across it, leaving a narrow opening of not more than 30 feet wide—(this is a favourite spot for the plunderers)—and reached the third halting-place. In the middle of the night an express reached me from Dádar, requesting me to halt, until a native of authority in the country, and who knew all the haunts of the robbers, should join me: this he did in the afternoon, with about eighty followers of various kinds, to be used as scouts. I took a scramble up a high hill in the neighbourhood of the camp, and discerned a wilderness of mountains, with extensive barren valleys; and, where the stream runs, a little green tract of coarse grass, which the camels feed on.

After our next march we encamped under a perpendicular scoop of a hill, which time and the torrent had worn away, laying bare the strata, in which regular veins of coal, but of a bad quality, are to be found: these strata are not above 6 inches in thickness, and recur at regular intervals of about 6 feet apart. The strata run nearly in this form ////, the coal appearing in black lines in that manner. I ascended this hill, and some higher ones, to see if the coal cropped out anywhere, or if there were traces of it in the scoops of other ravines, but without success. This halting-place

is called "the Lost Waters;" for the stream comes forth from the shingly bed, and after flowing for about a mile is again lost, leading one to suppose that water might be found by digging in any part of the bed of the stream. The ascent is gradual, about 100 feet in a mile.

The next march brought us to the source of the Bolan river, which issues out at the base of a rocky hill in a strong stream, and apparently at a warm temperature. It is said that sulphur is found in the vicinity of these mountains. I got upon the highest accessible point, and had a magnificent view of the pass downwards, recognising several of the remarkable peaks that we had passed upon the road. The general appearance of the country is that of rocky ranges of hills very abrupt, and regular sloping plains filling up the valleys: these are composed of gravel and boulder-stones of various sizes, and in different strata, sometimes large round stones, in others smaller pebbles; but all have a rounded appearance, and are hardened together into a rocky mass. It has the appearance as if the higher points had withstood a deluge, and the valley been filled up with all its débris. But the plains are cut into perpendicular and deep ravines by the torrents from the hills. There are remains of coarse herbage to be found, and I believe in the spring-time it has a more cheerful look; but everything now is dried up and burned from the great heat.

The next day I did not move off until I could see about me; for after about 3 miles of ascent through the bed of the torrent you enter that part of the pass where the marauders usually take their post. For about 3 miles the road runs between perpendicular cliffs, winding and locking in to each other, making short zigzag turns: the cliffs gradually increase in height from about 100 feet at the commencement to 500 or 600 in the centre. Notwithstanding all expectations, we were not molested anywhere, nor did we see any one, though the places where they haunt are easily to be discerned by the breastworks of rough stone on the heights, to conceal themselves and fire through. We passed the spot where the last attack was made,—the remains of the dead camels and horses and property strewed about, as well as blood—whether human or not, I will not say. The scouts I had with me, under the native I had waited for, had gone through this part in the morning, and reported that all was clear.

About 9 o'clock I found an open space, where the sun shone warm, where I halted the men, and allowed the advance-guard and baggage to pass on—(I had about 700 camels with me)—that I might see everything out of the pass before I left it, and wait the arrival of the carts. Hours passed away, and no tidings of them; so about 1 P.M. I went back to see where they were: I

found that the cattle could not get on; so I collected about 100 men of the infantry, with ropes, to pull the bullocks and all over the stones. In the upper part of the pass the hills become somewhat more rounded, and the road less confined; but it still presents the same wearisome difficulties, and the spurs of the hills lock into each other, and turn after turn, and objects of the same nature, constantly meet you. There is no lack of grandeur in all that is to be met with.

I am not a geologist to tell the nature of the rock; but it is generally in horizontal strata; you sometimes come upon places where it rises in curves, and in every conceivable angle. But the gravel boulders are not met with in the higher part of the pass.

At the top we experienced a great change of temperature: it is 5000 feet* above Dádar.

I reached this place the evening of the 27th November. This elevated valley is well watered by streams from the hills, which surround it in every direction, so that you never see the sun rise nor set: the hills, however, are all rocky and barren: it freezes every night, and in spots inaccessible to the sun it does not melt during the day; nor is the heat of the sun disagreeable at any time. Our fevers are leaving us, and we are all recovering our English complexions.

IX.—*Comparative Geography of Afghanistan.* Extract of a Letter from Major Rawlinson, dated Kandahar, May 1st, 1841.

Really and truly I cannot contrive to steal a single hour from my official duties to devote to my books or even to the arrangement of the multitudinous notes which I collected in Persia.

When relieved from the official drudgery which the presence of an army entails on me at this place, you will again find me a zealous contributor to your Journal, but in the mean time you must be content to receive such occasional scraps of information as I may be able to pick up from time to time, relative to the countries in which my lot is now cast.

I have discovered at a spot in the Ghilziyeh country (S.E. of Kandahar), now named U'lán Robát or Shahri-Zohák, the site of the ancient city of *Arachosia,* which dates from the fabulous ages of Semiramis, and the ancient name of which (Cophen), mentioned by Pliny and Stephanus Byzantinus, gave rise to the territorial designation of Kipin, applied by the Chinese to the

* Dr. Griffith's barometrical measurement (Journal of the Asiatic Society of Bengal, new series, No. xxxvii. pp. 54, 55) gives,—Dádar 742·6 feet above the level of the sea; Quettah, 5537.—Ed.

surrounding country. The ruins are of a very remarkable character, and the measurements of Strabo, Pliny, and Ptolemy are decisive as to the identity of the site. With this indication of locality we can explain the alleged contiguity of Arachosia to the country of the Massagetæ mentioned by Strabo and Stephanus. By the Massagetæ they mean the Sacæ who colonized the Huzareh Mountains in their transit from the Hindú Kush to Sacastan, or Seistan (Sijestán, or Sistan). The Arab geographers name the inhabitants of the mountains Sankán, or Sangán (the epenthesis of the nasal being common in eastern languages), and we have the modern representative in Deh Zangí, the present Huzareh capital.

Arachosia, which appears in the cuneiform inscriptions of Darius, is a curious subject altogether. The original name is Harakhwati (equivalent to the Sanscrit Saraswati), from whence came the Greek Arachotos and the Arab Rakhaj (which however seems to have applied to Kandahar), and the modern representative of which title is the Arghand-ab River.

The town of Kandahar was certainly the Greek Alexandria, or Alexandropolis, and was quite distinct from the capital of Arachosia.

I am a good deal puzzled about Zamín Dáwer, where there are the ruins of a noble city. It appears to be the Tazora of the Peutingerian Table, and the name originated, I suspect, with the Dahæ, a title to which I refer our modern Tájiks; but the subject is difficult of elaboration.

The valley of the Helmand, the Hermandus or Etymander of the ancients, presents a noble field for comparative geography, and I hope to make some interesting discoveries of ancient sites, on the return of an officer who is at present travelling through the lower basin of the river under my orders.

Beïhrám, the ruined city N. of Kábul, of which you have no doubt heard in connexion with Bactrian numismatics, is certainly the Alexandria ad Caucasum, and I take it also to represent the Greek Eucratidia (having been rebuilt by Eucratides), as it is named, in the Zend Avesta, Vaekeret, which is an evident attempt to represent the Greek Eucrat in Zend letters. The Capissa of Pliny, named Kia-pi-che by the Chinese, I believe to be the neighbouring city, known since the Arab conquest by the title of Farwawand, now called "Perwan Darrah," where the last action was fought with Dost Mohamed. Kábul is, beyond all doubt, Ortospana, which means "the white camp," or "the camp of the white people," a title that was reproduced in the Chinese Si-pi-to-Fa-la-se. Ghuzni can be traced from the remotest ages, and Lord Keane succeeded where Bacchus failed. The authority is Stephanus Byzantinus.

I have not pushed my inquiries much as yet beyond the Hindú Kush, or to the westward between Afghanistan and Persia, but to the southward I have a tolerable list of identifications. Píshing is the Pharsaga of Isidore of Charax; Mustang the Musarna of Ptolemy; Kwetí (Quetta), or properly Kot, Cottabura; and a multitude of minor emplacements may be identified.

One of the best illustrated subjects to the S. is the tribe of Abira. The Sanscrit writings name them Abhira, which signifies "shepherds," and place them along the mountains from the Bólán Pass to the sea. The Sacæ, or Scythians, came down from Seïstán and conquered them, extending their frontier to Pattalene or Sinde—hence the Indo-Scythia of Ptolemy and Arrian. Ptolemy also specially mentions the name of Abiria. Idrisi describes the same country as Abíle; and the capital of Kandabil, a name well known to the Arab geographers, and in the Turkish idiom signifies "the city of the Abílas, or Abíras." In modern times the title of the city has been tortured into Gandáwah, of which you have no doubt heard. A purer form remains in Bilah, a city and country between Kelát and the sea. One of these Scythian tribes was named also Mín, or Bín (for the *m* and *b* are commutable), and its migration can be traced the whole way from the Huzareh Mountains to the sea. The city of Bínah was well known to the Arabs in the hills E. of Herat (it is represented, I fancy, by the modern Keleb (?) Nau). Isidore mentions Μινπολις in Sacastan or Seistan, now called Bínáder, the capital of Gurmasíl or Garmasír; and in Arrian's time the chief city of Pattalene was Μινναγαρ, or the city of the Mín.

The Arab Sindic capital of Mansúrah, which has been hitherto laid down near Haïderábád, was certainly, as I have before mentioned to you, in the vicinity of the Manchúr (or properly Mansúr) Lake, and it arose, according to Yakut, on the ruins of Brahmanábád, a city which has also strangely enough been hitherto placed near the sea. I may also mention that Dádar, at the foot of the Bólán Pass, appears to represent the Τρουνδαδερ of the Byzantines, where a special miracle was wrought by the Nestorian priests under Kobád, or Fíróz (I forget which), the Sassanian King of Persia. The accumulation of materials of positive geography in these countries is going on steadily and satisfactorily, and I trust the Indian government will not delay much longer to display their treasures to the world.

ANALYSES.

I.—*The Structure and Distribution of Coral Reefs: being the First Part of the Geology of the Voyage of the 'Beagle,' under the command of Capt. Fitzroy, R.N., during the Years* 1832 *to* 1836. By CHARLES DARWIN, M.A., F.R.S., F.G.S., Naturalist to the Expedition.—Communicated by Colonel JACKSON.

IF, on the one hand, we have too frequently to deprecate the precipitancy with which theories and systems are raised upon the insufficient foundation of a few isolated facts; so, on the other, we have often occasion to regret that an immense number of valuable observations on the most interesting and important subjects remain dispersed, and therefore almost useless, long after there is more than enough from which to deduce some satisfactory conclusion. Ever prone to extremes, we either begin to build without sufficient materials, or go on collecting long after we have an abundant supply to complete the structure. Of the former of these errors, the cause and the consequences are alike evident—it springs from vanity, and ends in disappointment: as to the latter, it is to be attributed to ignorance, indolence, or incapacity—ignorance of what has been done, and indolence or incapacity to make a proper use of what is already collected to our hands; the consequence of which is, to keep us still unacquainted with what we should long since have known.

In effect, what an immense addition to our knowledge of the laws of nature should we possess if a tithe of the facts dispersed in the Journals of observant travellers, in the Transactions of academies and learned societies, were collected together and judiciously arranged! From their very juxta-position, plan, corelation, and harmony, before unsuspected, would become instantly visible, or the causes of anomaly be rendered apparent; erroneous opinions would at once be detected; and new truths—satisfactory as such alone, or supplying corollaries of practical utility—be added to the mass of human knowledge. A better testimony to the justice of this remark can hardly be afforded than in the work before us—Mr. Darwin's 'Structure and Distribution of Coral Reefs.' To indefatigable research—and, there-

fore, to a perfect acquaintance with what has been observed and written by others on coral reefs—Mr. Darwin has added his own personal examination of a great many of those interesting structures; and, from the manner in which he has grouped the facts, and then reasoned upon them, the mind remains satisfied that he has detected the law, or rather the process, of nature in their formation. We can do little more, however, in this place than give an outline of the author's arrangement in this highly interesting monograph.

The work is divided into six chapters, preceded by an Introduction, and followed by a copious Appendix; there are also three charts and a few illustrative woodcuts.

In the Introduction, Mr. Darwin adopts the classification of coral reefs into "lagoon islands," or "atolls,"—"barrier" or "encircling reefs,"—and "fringing" or "shore reefs:" though, as he subsequently shows in Chapter V., and declares at p. 102, "the three classes graduate into each other."

Chapter I. treats of "atolls," or "lagoon islands," and is divided into three sections, of which the first is especially devoted to a description of Keeling Atoll, "its structure being in most respects characteristic of the class to which it belongs." The second section contains a "general description of atolls;" and in the third and last section of this chapter the author enters more minutely into the consideration of that remarkable group the "atolls of the Maldiva Archipelago," and of the great "Chagos Bank."

Chapter II. treats of "barrier reefs." In it the author shows the general resemblance in form and structure between "true atolls" and "barrier reefs;" the only characteristic difference being, that in the latter there rises from the central lagoon one or more islands. The remarkable fact of the breaches in the encircling reef being immediately opposite the main valleys of the enclosed land, and the general prevalence of gaps on the leeward side, are pointed out, and satisfactorily accounted for. The probability that barrier reefs are of great thickness is clearly shown; and though, from the known fact that the reef-building polypifers cannot live at great depths, the fact would seem doubtful, yet Mr. Darwin's theory, developed in a subsequent chapter, satisfactorily clears up the apparent difficulty. In the present chapter, however, he confines himself to explaining why the opinions hitherto entertained on the formation of these reefs are quite inadmissible.

Chapter III. is on "fringing" or "shore reefs." These are minutely described, particularly those of Mauritius; and, from the various facts regarding them, it appears that "the dimensions and structure of fringing reefs depend entirely on the greater or

less inclination of the submarine slope, conjoined with the fact that reef-building polypifers can exist only at limited depths." It would further appear that "in some cases fringing reefs are considerably modified in outline by the course of the prevailing currents."

Chapter IV. is devoted to the growth of coral reefs, and is divided into three sections: first, "on the distribution of coral reefs, and on the conditions favourable to their increase;" second, "on the rate of growth of coral reefs;" third, "on the depths at which reef-building polypifers can live." With regard to the limits of latitude over which coral reefs extend, they seem to be confined to within 30 degrees of the equator, N. and S.; but their distribution within this zone appears to be so capricious, that it cannot be explained by any cause hitherto assigned. As for the rate of growth, it would appear from some facts that it is extremely slow, and from others again almost as quick, geologically speaking. The depth at which corals and corallines can live is very various, and depends chiefly upon the kind of coral and on local circumstances; the reef-building polypifers, it would seem, "do not flourish at greater depths than between 20 and 30 fathoms."

In the four chapters just mentioned, Mr. Darwin has confined himself generally to the arrangement and detail of facts.

Chapter V. is on the theory of the formation of the different classes of coral reefs; and, with Chapter VI., constitutes the most interesting part of the work. In Chapter V. are discussed the various opinions that have been entertained on the formation of coral reefs, none of which satisfactorily accounts for all the phenomena observed: the author therefore propounds his own theory; and we are free to confess it satisfies our own mind completely, and will, we have little doubt, be generally received as the only plausible explanation of all the facts. It applies equally well to every appearance; and we know of nothing more ingenious than the manner in which the apparently compound arrangement, if we may so term it, of the atolls of the Maldiva Archipelago is accounted for, and the extraordinary structure of the Great Chagos Bank explained. Subsidence, either gradual or sudden, and as by paroxysms, is, according to Mr. Darwin, the sufficient cause of all the phenomena presented by coral reefs, however anomalous they may at first appear.

Chapter VI. is appropriated to the "distribution of coral reefs with reference to the theory of their formation;" and is, like Chapter V., of the greatest interest to all who would study the details of the earth's superficial structure.* The subject of this

* We use the term *superficial* designedly, considering, as we do, all comprised between the limits of our highest mountains and our deepest soundings in the ocean as forming but a thin pellicle of our globe, compared with its diameter and mass.

chapter is elucidated by a chart, which, as Mr. Darwin says, and we readily believe him, is "the result of many months' labour." In this part of his work, Mr. Darwin considers the relation which active volcanoes and areas of elevation bear to areas of subsidence; and though in some cases the two phenomena appear to approach nearer than they should do for the sake of the theory, still they nowise contradict it; for we hold that whenever there is subsidence there will probably be, at a nearer or greater distance, a corresponding elevation—the result of oscillation, or what the French geologists term *mouvement de bascule*. Moreover, the direction of the spaces coloured red on the map, and which represent the areas raised, is such relatively to the spaces coloured blue and indicating the depressed areas, that their co-relation of effect seems evident on simple inspection, though their synchronism of action cannot in all cases be fully established.*

In concluding this sixth chapter of his work, Mr. Darwin recapitulates all that has preceded it, and we cannot give a better summary than in his own words:—

"In the three first chapters the principal kinds of coral reefs have been described in detail, and found to differ little as far as relates to the actual surface of the reef. An atoll differs from an encircling barrier reef only in the absence of land within its central expanse; and a barrier differs from a fringing reef in being placed at a much greater distance from the land, with reference to the probable inclination of its submarine foundation, and in the presence of a deep-water lagoon-like space or moat within the reef. In the fourth chapter the growing powers of the reef-constructing polypifers were discussed; and it was shown that they cannot flourish beneath a very limited depth. In accordance with this limit, there is no difficulty respecting the foundations on which fringing reefs are based; whereas with barrier reefs and atolls there is a great apparent difficulty on this head—in barrier reefs, from the improbability of the rock of the coast or of banks of sediment extending in every instance so far seaward within the required depth; and, in atolls, from the immensity of the spaces over which they are interspersed, and the apparent necessity for believing that they are all supported on mountain-summits, which, although rising very near to the surface-level of the sea, in no one instance emerge above it. To escape this latter most improbable admission, which implies the existence of submarine chains of mountains, of almost the same height, extending over areas of many thousand square miles, there is but one alternative,—namely, the prolonged subsidence of the foundations on which the atolls were primarily based, together with the upward growth

* Though perfect co-relation of direction between the lines of elevation and subsidence would seem to argue synchronism of action, the want of this co-relation of direction is no proof that the different effects did not take place simultaneously: for if, as is probable, the double action of subsidence and depression supposes rupture of the mass or crust of the earth, this may be effected in various directions at the same time, according as the lines of least resistance run in relation to the disturbing force.

of the reef-constructing corals. On this view every difficulty vanishes: fringing reefs are thus converted into barrier reefs; and barrier reefs, when encircling islands, are thus converted into atolls the instant the last pinnacle of land sinks beneath the surface of the ocean.

"Thus the ordinary forms and certain peculiarities in the structure of atolls and barrier reefs can be explained; namely, the wall-like structure on their inner sides—the bason or ring-like shape both of the marginal and central reefs in the Maldiva atolls—the union of some atolls, as if by a ribbon—the apparent disseverment of others—and the occurrence, in atolls as well as in barrier reefs, of portions of reef, and of the whole of some reefs in a dead and submerged state, but retaining the outline of living reefs. Thus can be explained the existence of breaches through barrier reefs in front of valleys, though separated from them by a wide space of deep water; thus, also, the ordinary outline of groups of atolls, and the relative forms of the separate atolls one to another: thus can be explained the proximity of the two kinds of reefs formed during subsidence, and their separation from the spaces where fringing reefs abound. On searching for other evidence of the movements supposed by our theory, we find marks of change in atolls and in barrier reefs, and of subterranean disturbances under them; but, from the nature of things, it is scarcely possible to detect any direct proofs of subsidence, although some appearances are strongly in favour of it. On the fringed coasts, however, the presence of upraised marine bodies of a recent epoch plainly shows that these coasts, instead of having remained stationary—which is all that can be directly inferred from our theory—have generally been elevated.

"Finally, when the two great types of structure—namely, barrier reefs and atolls on the one hand, and fringing reefs on the other—are laid down in colours, as on our map, a magnificent and harmonious picture of the movements which the crust of the earth has within a late period undergone is presented to us. We there see vast areas rising, with volcanic matter every now and then bursting forth through the vents or fissures with which they are traversed. We see other wide spaces slowly sinking without any volcanic outbursts; and we feel sure that this sinking must have been immense in amount as well as in area, thus to have buried over (under?) the broad face of the ocean every one of those mountains above which atolls now stand like monuments, marking the place of their former existence. Reflecting how powerful an agent, with respect to denudation, and consequently to the nature and thickness of the deposits in accumulation, the sea must ever be, when acting for prolonged periods on the land, during either its slow emergence or subsidence; reflecting, also, on the final effects of these movements in the interchange of land and ocean-water—on the climate of the earth—and on the distribution of organic beings; I may be permitted to hope that the conclusions derived from the study of coral formations, originally attempted merely to explain their peculiar forms, may be thought worthy of the attention of geologists."

The work concludes, as we have said, with an Appendix. In this will be found the detailed description of all the reefs and

islands in the map; namely, all those of the Pacific Ocean, the East Indian Archipelago, the Indian Ocean, the coast of Africa, the Red Sea, the West Indies, and the Bermuda Islands. There is also a copious index for reference.

Upon the whole, we can safely say we have rarely met with a work every way so satisfactory. Industry of research, and consequent abundance of facts, scrupulous attention in acknowledging the sources whence all that has not been observed by himself has been derived, candour and modesty in the discussion of the subject, order in the arrangement, and lucidity in explanation—all combine to render this monograph highly deserving the attention of the geographer, the navigator, and the *savant*, to whom we cordially recommend it accordingly; and we wait with great impatience the works promised by the same talented naturalist on Volcanic Islands and on South America.

II.—*The Negroland of the Arabs Examined and Explained; or, An Inquiry into the Early History and Geography of Central Africa.* By WILLIAM DESBOROUGH COOLEY.—By the Editor.

THE rich materials for Comparative Geography contained in the writings of Arab geographers and historians have hitherto been employed in a desultory and unsatisfactory manner. The philologists who have mastered the difficulties of their language have rarely, if ever, possessed a scientific knowledge of geography; and the geographers who have had recourse to their writings to bolster up their own theories have in general had at the most but a smattering of Arabic. The consequence has been that what Mr. Cooley says of the Arab geography of Africa is applicable to all the geographical writings of the Arabs:—

"The Arab geography of Africa lies, at present, a large but confused heap of materials, into which modern writers occasionally dip their hands, each selecting what appears to serve his purpose, and adapting it to his views by an interpretation as narrow and partial as his mode of inquiry. Modern geographers—D'Anville and Rennell not excepted—have allowed fancied resemblances of sound to lead them far away from fact and the straight path of investigation. They have, for example, unanimously assumed the Kanó of the present day to be the Ghánah of past ages. The disorder introduced into the early geography of Central Africa by this false method of proceeding has deprived it of all its value. It seems incapable of combining with the results of modern discovery; and, instead of the harmony which ought to subsist between our present information and the ample accounts of Negroland written

five or six centuries ago, we find in almost every application of the latter the jarring consequences of false assumptions."

Mr. Cooley, with that true manly modesty which springs from a full but exact sense of what he has really been able to accomplish, gives out his work for nothing more than it really is :—

"The following Essay has for its object to establish the early geography of Central Africa on a solid basis. It aims at offering a clear and well-grounded explanation of the geographical descriptions of Negroland transmitted to us by Arab writers; and, by thus connecting the past with the present, at giving an increased value to the historical information derived from the same sources." And :—"The attempt here made, however successful it may be deemed—and it cannot be denied that it broaches some truths, and discloses a new and logical method of treating an interesting subject—is yet but a sketch which remains to be filled up, after a careful examination of the numerous Arabic MSS. preserved in the public libraries here and abroad, by some one better qualified for that labour, and enjoying fairer opportunities, than the writer of these pages."

The great merit and value of Mr. Cooley's work spring from his critical accuracy in estimating the reliance to be placed upon his authorities as evidence, and the cautious logical strictness with which he draws his inferences. It furnishes a rule for the examination of those more numerous sources of information to which the author refers, and an example of the method of applying it in practice.

It must not be inferred, from the importance here attributed to Mr. Cooley's work, as a specimen of strict scientific examination of evidence, that this is its only merit. He has also elicited important positive results. He has, what no author has done before him, placed in a clear and satisfactory point of view the nature and extent of the knowledge which the Arab writers from A. D. 1050 to A. D. 1400 possessed of the countries in Africa S. of the Atlas range, and W. of a line nearly coinciding with that traced by Ritchie, Lyon, Oudney, Denham and Clapperton, in their progress from Tripoli to the interior. Future investigators may fill up in many particulars the sketch Mr. Cooley has traced; but he has furnished us with an outline of what was really known of the region here indicated, to a people possessed of a literature, during the three centuries and a half immediately preceding the commencement of the Portuguese discoveries under the auspices of Henry the Sailor. The addition thus made to historical, as contradistinguished from conjectural geography, can at once be seen and appreciated. Having ascertained what the Arab geographers of these three centuries and a half really did know, and in what manner they expressed their knowledge, we are in a condition to trace the errors which disfigure the European maps and geographical

systems of the middle ages to their source. The gain for scientific geography is twofold: in the first place, we are enabled to detect what is erroneous in the notions of our earlier European navigators, and winnow their wheat from their chaff; in the second place, we are furnished with an addition to our catalogue of the causes of geographical error, alike valuable as the foundation of a sound criticism of ancient writers, and as warnings against error in modern investigation. The gain for geography as subordinate to historical inquiry, which results from Mr. Cooley's essay, is equally great. It lends distinctness and reality to the history of the portion of the earth it relates to for three whole centuries previous to the commencement of the Portuguese discoveries. Whether the centuries which intervene between the earliest date thus established and the more remote Greek and Roman historians, will ever be made equally clear, depends upon the researches of those who shall apply Mr. Cooley's method to other Arab writers. It is much to be desired that the experiment were tried with his caution and perspicuity on the region lying between the Nile and the line of Denham and Clapperton's journey.

The basis of Mr. Cooley's researches is supplied by the travels of El Bekrí (b. 1040-1; d. 1094-5) and Ibn Batútah (who crossed the desert and visited the land of the negroes in the course of the years 1350-1353). The historical information required to explain some differences of nomenclature which occur in the writings of these two authors is derived from Ibn Khaldún (b. 1332; d. 1406). Some additions to the geographical information they communicate are derived from Ibn Khaldún, as also from the works of Idrísí (*circa* 1153) and Ibn Saíd (in the latter half of the thirteenth century); but their notices are taken as supplementary and in so far as they harmonise with the statements of El Bekrí and Ibn Batútah. The caravan route preserved by El Bekrí, and the route travelled by Ibn Batútah in person, are the nucleus of Mr. Cooley's Arab geography of western Negroland, and the region intervening between it and the Atlas range: the information which these authors collected respecting the countries situated E. and W. of their routes is added, after being subjected to a searching criticism; and the other authors named, together with a few more, are consulted to fill up *lacunæ*, or explain what is vague or confused. The positive assertions of eyewitnesses are taken as far as they go, and only where they stop short is recourse had to the secondhand evidence of systematic writers. The amount of information is thus materially reduced, but its trustworthiness is proportionally increased.

The results of this investigation are several routes from the southern base of the Atlas to the northern frontiers of Negroland:—1st. El Bekrí's, from Támedelt to Aúdaghost; thence to

the Niger, a little above the termination of its course to the northward, along the great northern bend of the river, and eastward as far as Tádmekkah: 2nd. Ibn Batútah's, from Sijilmésah to Karsekhó on the Niger above Jenne; thence along the circumference of the great northern curve of the river, thence eastward to Tekaddá, and thence north-westward to Twát. The account which these travellers give of the physical features of the country through which they travelled, and the distances and relative positions derived from their researches, harmonise with the most recent and exact information of European travellers. We are therefore possessed of two trustworthy routes, beginning at the southern base of the Atlas, terminating at the Niger, and intersecting each other on the way. We are also possessed of a route (Ibn Batútah's) crossing a part of the same region (from Tekaddá to Twát) considerably to the E. of these two. And lastly, we have the cross route (described by both) connecting the southern extremities of the three here mentioned. These are laid down upon the authority of eye-witnesses. In addition to this we have information which, coming from El Bekrí, whose preservation of the exact caravan distances is a warrant for his accuracy, respecting the country which lay between his route and the sea—a route intersecting his own nearly corresponding with that of Ibn Batútah—the distances from Wád Nún to Aúlíl, along the shores of the ocean, and from Aúlíl eastward to the negro kingdom of Ghánah—together with some indication of the physical structure and products of the region thus traversed. Idrísí gives the distances from Sijilmésah to Wád Nún, and thence to Aúlíl: like all that writer's distances, they are too short; but this is an error to which all mere book geographers are liable. Idrísí's statements would establish nothing of themselves; but, as far as they go, they corroborate El Bekrí's. Ibn Batútah indicates at the eastern termination of his wanderings the line of road which conducts to Egypt; and El Bekrí mentions the point in the desert to which the roads from Wergelán, Twát, and Télemsén converge in order to pursue the same course thence to the southward. This amount of information places the geography of the region between the Atlas to the N., the Senegal and the Niger to the S., on a respectable footing. The nomenclatures of El Bekrí and Ibn Batútah differ materially, but the historical writings of Ibn Khaldún sufficiently explain the difference. In the time of El Bekrí the great frontier state of Negroland was Ghánah, and it extended a good way N. of the parallel of Tomboktú. The country between Ghánah and the Atlas was occupied by the great Berber tribe, the Zenágah. The most important clans or minor subdivisions of that tribe were the Lumtúnah, N. of the Great Desert from the ocean towards Sijilmésah; the Benú Goddálah, S. of the Desert from the ocean to-

wards Ghánah; and the Benú Masúfah, in the Desert on the line of the caravans. In the time of Ibn Batútah the Málí had subdued Ghánah, and formed the great frontier state of Negroland on the Niger, but the encroachments of the Berber race had forced the frontier line of Negroland backwards to the S. The revolution effected in N.W. Africa by the rise of the Morabite dynasty had changed the position of the Berber clans; the Maghrawah occupied the region formerly frequented by the Benú Goddála; the Lumtúnah and Benú Masúfah retained their old seats, but new tribes were interspersed among them. For more minute details the reader is referred to Mr. Cooley.

The information respecting Negroland contained in the writers so carefully analysed by Mr. Cooley scarcely warrants the expression "ample accounts," which he has somewhat incautiously used. We will not, however, be so captious as to quarrel with him for one loose expression in his Introduction. He has stated clearly and without exaggeration in the body of the work what that information amounts to. El Bekrí's caravans and Ibn Batútah in person appear to have penetrated on the W. to a point rather above Jenne on the Niger, and on the E. to a point about 6 days' journey to the S. of that at which the Niger's course to the E. is changed for one to the S. A line connecting Sego with this last-mentioned extreme point of the Arab travellers appears to form the farthest limit of what they had examined in Negroland with their own eyes. This is not penetrating very far into the interior of the region; and the part visited was bounded on the W. by the route connecting the vicinity of Sego with Támedelt, and that connecting Kagho or Kaúkaú with Tekaddá. Negroland E., S., and W. of the small portion here defined was known to the Arab writers only from hearsay; and it does not clearly appear whether their information was derived in part from Arab or Berber traders who had penetrated farther, or exclusively from negroes. Genéwah appears to have been the general designation of Western Negroland, from the ocean to the most eastern meridian attained by El Bekrí or Ibn Batútah. It may have included countries still farther E., but so far it certainly extended. This Genéwah appears to be the origin of the Portuguese Ghinoia, from which the various European modifications of the name Guinea are derived. Gnewa, or Genewa, in the language of Tomboktú, is said to signify black: and probably Genéwah was synonymous with es-Soudan, the land of the blacks. On the great northern bend of the Niger was situated in the time of El Bekrí the negro state Ghánah; in the time of Ibn Batútah that of Málí. To the S.W. of Ghánah, El Bekrí heard of Sínghánah and Tekrúr; to the S. Ghúntil; to the E. of S. Ghaïárú, Daúr, and Melil—all negro states or tribes. Ibn Batútah affords no indication of the extent of Málí to the W.

and S.; but S.E. of it he mentions Múlí, in the country of the Límiyín, and Yúfí (Nufi?), one of the greatest states of Negroland. Ibn Khaldún has borrowed from Ibn Saíd (who wrote before the close of the thirteenth century, consequently between the journeys of El Bekrí and Ibn Batútah) a list of twelve negro states extending from the shores of the Western Ocean to the Nile. For its details, however, as well as for an idea of the light reflected on it from the writings of Makrízí and Leo Africanus, we must refer to Mr. Cooley's pages.

Enough has been said to account for the importance we attribute to the appearance of this work; more could not be accomplished in the brief space of an analysis like the present. The book is characterised throughout by acuteness and sound judgment. Further inquiry must necessarily modify some of its details, but the outline will remain unaffected. From the dedication we learn that the Essay was suggested by some extracts from the writings of Ibn Khaldún and Ibn Batútah, communicated by Don Pascual de Gayangos to the author. From a note at p. 70 we are led to infer that the eminent Arabic scholar just named has completed a translation of the entire work of Ibn Batútah, of which he possesses a copy. Every geographer must join in the wish expressed by Mr. Cooley that this translation may soon be presented to the public.

III.—*Recherches sur la Priorité de la Découverte des Pays situés sur la Côte Occidentale de l'Afrique, au delà du Cap Bojador, et sur les Progrès de la Science Géographique, après les Navigations des Portugais, au XVme Siècle.* Par le Vicomte de SANTAREM. Accompagnéés d'un Atlas composé de Mappemondes et de Cartes pour la plupart inédites, dressées depuis le XIme jusqu'au XVIIme Siècle.—By the Editor.

THE noble author of this valuable contribution to the history of geography says at the conclusion of his introductory remarks,—"We give up the form of our work to the critic: it is full of repetitions, but it has been necessary to recur often to the same authorities, either to throw a strong light on the most memorable of discoveries, or to place our arguments on a secure foundation. Many of the faults which may be attributed to this work are inherent in its nature. In another volume, which we propose to send to press in the course of this year (1842), and in which we inquire into the causes which contributed to prepare the Portuguese and Spaniards to undertake their great maritime expeditions in the fifteenth century, we will fully develop some

points in the history of cosmography and the construction of maps, which we have only been able to touch upon in passing in this work."

In forming an estimate of the merits of the Vicomte's Researches, it is but fair to keep these remarks in view. The work is polemical: its direct and main object is to settle the question as to the priority of the discovery of the S.W. coast of Africa; the light which it throws on the history of geography and geographical science is an indirect consequence of the manner in which the argument is conducted. It is true that the indirect results of the investigation are, in our eyes, of far more consequence than the direct; but that they are the indirect results is a sufficient apology for what severe criticism might find fault with in the manner of stating them.

In his main object we admit that the Vicomte appears to us perfectly successful. He has proved that there is no reason to believe that either the Arabs or any European nation ever navigated the ocean which washes the shores of western Africa to the S. of Cape Bojador before that cape was doubled, in 1433, by Gil Eannes; and more particularly he has proved that there is no credible evidence to support the stories of discoveries on that coast by the mariners of Dieppe in 1364, and of a commercial intercourse between Normandy and the west coast of Africa established in consequence of these discoveries.

The first author who mentions the voyages of the Dieppe mariners to the S.W. coast of Africa is Villaut de Bellefond, who, having made a voyage to the coast of Guinea in 1666-67, published an account of it, which he dedicated to Colbert. This author asserts that previous to 1364 trading expeditions had been made from Normandy to the Atlantic coast of Africa, and that in that year "the merchants of Rouen joined with those of Dieppe to fit out four vessels instead of two for the coast of Guinea." Villaut makes this assertion without citing any authority in support of it. In 1671 the Sieur d'Elbée published an account of his voyage to the islands on the coast of Guinea in 1669-70, in which he repeats Villaut's story, but without adducing any authority. Manesson-Mallet, who published a 'Description de l'Univers' in 1683, repeats the assertion in the same loose manner. A description of the coasts of Guinea was published at Amsterdam by Dapper, a Dutch physician, in 1686. This author, speaking of Mina, says,—"Some years ago the Dutch, repairing a battery which is called the French Battery, because in the opinion of the natives the French were masters there before the Portuguese, found the two first figures of the number thirteen hundred cut upon a stone, but it was impossible to distinguish the other two," &c. The Sieur de la Croix, in his 'Rélation Universelle de

l'Afrique Ancienne et Moderne,' published in 1688, and Masseville, in his 'Histoire Sommaire de Normandie,' published at Rouen in 1693, mention the discoveries of the Dieppe mariners; but both cite Manesson-Mallet as their authority. In 1708 Corneille, in one of the articles of his Geographical Dictionary, repeats the assertion, but the article is copied almost *verbatim* from Villaut. In 1728 Père Labat at last professes to give something like evidence for the assertion. He quotes as his authority a paper in the archives of Dieppe, adding, "The fire at Dieppe in 1694 is the cause why I do not insert this document at length, but the date and other circumstances are extracted from manuscript annals of Dieppe." These "annals," he says, are in the possession "of one N——." The story is repeated by several other authors: the only one, however, which deserves mention, and that only on account of its official character, is the 'Notice Statistique des Colonies Françaises,' vol. iii., published at Paris by order of the government in 1839. It is enough to say that the compilers of this report have been able to produce no contemporary document relating to French commercial companies trading with Africa of an earlier date than 1664, and no commercial treaty with African kings of an earlier date than 1785. This, we believe, is the whole case in support of the discoveries of the Normans on the S.W. coast of Africa in the fourteenth century: for the argument founded on the enterprising spirit of the Normans, and the possibility of their having made discoveries on the coast of Africa, is of too shadowy a nature to be grappled with. It rests, moreover, upon a fallacy: Normans, when used to designate hardy maritime adventurers, means the piratical bands who issued from the north of Europe; when used to designate the pretended discoverers of the S.W. coast of Africa, it means the inhabitants of the French province of Normandy. The few real Normans among the inhabitants of that province were very differently employed in the fourteenth century than in making trading voyages, and the remainder of the population of Normandy were not a whit more enterprising mariners than the rest of the French nation.

The evidence in support of the Dieppe discoveries may be easily disposed of. With the exception of Dapper and Labat all the authorities cited merely echo one another. They repeat a story which appears to have grown up among the French about the middle of the seventeenth century (for it is not necessary to suppose that Villaut deliberately invented it), that the French had made settlements on the Atlantic coasts of Africa before the Portuguese. No written evidence of their having done so of an earlier date than Villaut has yet been adduced. The opinion of the natives referred to by Dapper is no sufficient evidence of

what must have happened more than 300 years before his time. His story of the stone, with some year in the fourteenth century engraven on it in *Arabic numerals*, is palpably a mistake of ignorant men. The assertion of Père Labat that a document existed in the archives of Dieppe previous to the fire of 1694, is untenable. Masseville, whose History of Normandy was published the year before the fire, and who repeats Villaut's story, knows nothing of this document. Besides, the merchants of Rouen are said to have been partners in the company trading to Africa in the fourteenth century, as well as those of Dieppe: the archives of Rouen have not been burned, yet nothing has been discovered in them bearing upon commercial transactions, which, according to Villaut, were diligently prosecuted from 1364 to 1410. There is, moreover, something very suspicious in Labat's reference to "manuscript annals," of which he does not mention the date, and which he describes as in the possession "of *one* N———." A more worthless chain of evidence can scarcely be found in the annals of imposture or error.

It is contrary to the sound laws of evidence to call upon a man to prove a negative. The Vicomte de Santarem might have rested satisfied with showing that those who maintain the reality of the Dieppe discoveries have what a lawyer would call "no case." But he goes further, and shows, by an elaborate marshalling of the evidence of Arab authors and of travellers, cosmographers, and map-makers belonging to all nations of Europe, from a date considerably preceding the first Portuguese discoveries down to a few years before Villaut's publication, that the Portuguese were the first to explore and give name to the western coast of Africa, S. of Cape Bojador. The most curious part of this division of the investigation is the unanimous testimony of French historians, cosmographers, and map-makers of an earlier date than Villaut, to the priority of the Portuguese discoveries. But for the details we must refer the reader to the work itself.

In removing an error from the field of historical geography, the Vicomte de Santarem has done good service. He has shown that the story of the Dieppe discoveries on the S.W. coast of Africa has no business there. Even though it should hereafter be discovered that mariners from Dieppe did visit that coast in or about 1364, their voyage added nothing to the geographical knowledge of Europe: it has left no trace of itself in geographical nomenclature. It is not even of so much importance as that *ignis fatuus*, the legend of the Zeni, which at least confused and bewildered the geographical nomenclature of Europe for a time. The Dieppe voyage, supposing it to have taken place, did not even introduce errors into geography; it passed like a bird through the air, leaving no trace behind it. Its history, if it ever hap-

pened, belongs to the history of romantic personal enterprise, not of geographical science.

After all, however, what constitutes the principal value of "the Researches" in our estimation, is its Atlas of old (many of them unedited) maps, and the passages scattered here and there, which throw light upon the history of map-making. The Atlas contains fac-similes of the whole or portions of two maps of the eleventh century, one of the twelfth, one of the thirteenth, seven of the fourteenth, nine of the fifteenth, seven of the sixteenth, and three of the seventeenth. Of these no less than sixteen are now published for the first time. As the illustrations of the Atlas are kept strictly subordinate to the main object of the work, some of these maps are only given in part, and are thus less valuable as monuments of the history of the art: so little has been done, however, in this department of geographical history, that even these fragments are welcomed with avidity.

These maps may be divided into three classes, totally differing in character from each other. To the first, we would refer all the "mappemondes" of a circular figure, beginning with that contained in a MS. of the eleventh century, in the library at Leipzig, ending with that found in a MS. of the fifteenth, of Pomponius Mela, in the library at Rheims, and among the rest the celebrated map of Marino Sanuto. These are intended to represent as much of the world as was known to the compilers; the outline is arbitrarily selected, and has no necessary reference to the real figure of the earth, or circles of latitude and longitude. The farthest known regions of Africa are placed where, in our circular maps of the world, is the south pole; the remotest known regions of Europe near the north pole; the western extremity of Europe, and the eastern of Asia, at the opposite ends of the diameter of the hemisphere. This is a representation of the habitable earth (more properly *the inhabited* ὁ οικουμενος) as old as the time of Homer. The limits of the known world had been greatly widened since his day, but it was still considered as an immense island surrounded by a great ocean. The earliest of these maps (if they deserve the name) are very rude. Two lines parallel with the N. and S. diameter of the circle represent the Hellespont, and the sea which washes the coasts of Asia Minor and Syria. Two parallel lines, extending from the W. to those already mentioned, represent the rest of the Mediterranean. The double surrounding circle represents the main ocean. The eastern section of the circle is Asia; the north-western, Europe; the south-western, Africa. At the E. point is placed "Paradisus;" and the names of the principal states and empires are written down with equal contempt of chronology and local position. Sometimes an attempt is made to represent the posi-

tion of Troy, Jerusalem, Rome, Constantinople, &c., by pictures of a city wall. As we come down nearer to our own time the straight lines are gradually transformed into irregular curves, intended to represent the outlines of coasts; and the map of Sanuto, and that in the MS. of Pomponius Mela, at Rheims, evince extensive, and sometimes accurate, geographical knowledge. But the necessity which the arbitrarily-selected form of their outline imposes on the compiler, of modifying the relative positions of distant regions to accommodate it, renders the best of them of comparatively little value.

The second class contains the maps of which that which is found among the Cottonian MSS. in the British Museum, and *said to be* of the eleventh century, the planisphere of Cecco d'Ascoli, of the thirteenth century, and the chart of Africa from the edition of Ptolemy published at Rome in 1508, are specimens. The chart from the Cottonian library appears to be constructed with reference to the relative positions of parallels and meridians, or at least of climates. The planisphere of Cecco d'Ascoli is really a representation of a hemisphere, on which the drafts of Europe, Asia, and Africa, which fill up the whole circle of the first class, are made, with tolerable accuracy, to occupy their proper places, N. of the equator. The last-mentioned specimen is such a section of the hemisphere projected on a plane as is still in use. The works of the first class are little better than toys: in those belonging to the one at present under review we can trace the progress of geographical knowledge during the middle ages.

Of infinitely more value for the purposes of positive and practical geography than either of the two preceding classes is the third. Maps of this class are alluded to in the following passage, quoted by the Vicomte de Santarem from Ibn Khaldún:—"These islands [the Canaries] were discovered by chance, because ships do not navigate these seas unless when driven there by storms. But the two countries [Europe and Africa] on the two shores of the Mediterranean are perfectly known, and are traced on plans and sheets of paper in their real forms; the *rhumbs* of the winds too are marked on them: these plans or papers are called *alkanbas*. Sailors guide themselves by these charts in order to accomplish their voyages; but there is nothing of the kind for the Atlantic Ocean: this is the reason why ships do not venture into this sea, because if they lost sight of the coast they would not know how to work back to it." (p. 100.)

Ibn Khaldún speaks of these marine charts as no novelty in his time (1332-1406): the earliest of which specimens are given in the Vicomte de Santarem's atlas are — the Pizzigani map of 1367, the Catalan map in the king's library at Paris, of

1375, and the map in the MS. atlas in the Pinelli library, of 1384-1400. Maps like these, constructed so as to be of practical utility to navigators, may be presumed to have been delineated with more anxious accuracy than those of mere speculative geographers. Their compilers would be constantly reminded of any errors they might fall into by the bearings which are introduced into them. The introduction of these charts into common use was an era in geography: since that time there have been greater accuracy and precision in the delineation of the outlines and relative positions of sea-coasts at least. The great difficulty of tracing the route of "the ten thousand" arises from the omission of the *bearings;* since the introduction of *alkanbas,* first mariners, and at a later period travellers by land, have adopted the practice of noting the direction of their routes, as well as the distances travelled. This has given a distinctness and coherence to geography which it wanted before.

The charts of the third class representing the W. coast of Africa, which are given in the atlas of the Vicomte de Santarem, contain the history of the geography of that coast. The researches of Mr. Cooley and the Vicomte have established that, previous to the doubling of Cape Bojador, the W. coast of Africa was only vaguely known to the Arabs and Berber tribes at the mouth of the Senegal. It was coasted by no sailors; for the accidental shipwreck of Ibn Fathuma, apparently in the neighbourhood of Arguim, cannot be called a navigation. Our knowledge of the western coast of Africa S. of Cape Bojador begins with the discoveries of the Portuguese, and its progress is registered in these charts. The most important are—Map of Andrea Bianco, 1436; of Gabriel Valsequa, 1439; of Frà Mauro, 1460-70; maps of Gracioso Benincasa of Ancona, 1467 and 1471; map of Juan de la Cosa (Columbus's pilot), 1500; of Diego Ribero, 1529; of Jacques de Vaulx, 1533; of Joam Martinos, 1567; of Guillaume Levasseur, of Dieppe, 1601; of Dupont, of Dieppe, 1625; and of Jean Guerard, 1631. The selection has been determined by the consideration that the authors of these maps (Spaniards, Italians, and Frenchmen) were above suspicion of partiality to the Portuguese, and that their nomenclature, being copied from the Portuguese charts, was evidence of the priority of Portuguese discoveries. This does not add to their value as historical monuments; but when the eminence of the compilers is taken into account, neither does it detract from it. The materials furnished for the history of African geography by the Vicomte de Santarem commence where those supplied by Mr. Cooley's researches terminate, and bring it down to the seventeenth century. They give a truth and precision unknown before to the outline of the African continent. When Mr. Cooley, or some writer treading in his foot-

steps, shall have done for Leo Africanus, Marmol, and others, what he has done for El Bekrí and Ibn Batútah, the result, combined with the labours of the Vicomte de Santarem, will bring down the history of Western African geography to the era when the European attempts to explore the interior commence. It is for this reason that we attribute more value to the indirect than to the direct results of the Vicomte's investigations.

The importance of publishing all ancient maps of any tolerable degree of authenticity that can be recovered is a topic legitimately suggested by the publication under review; but this analysis has already run to such a length that our remarks on that theme must be reserved for another opportunity.

IV.—1. *A Personal Narrative of a Visit to Ghuzni, Kabul, and Afghanistan.* With Illustrations. By G. T. Vigne, Esq. F.G.S. 1 vol. 8vo.

2. *Travels in Kashmir, Ladak, Iskardo, the Countries adjoining the Mountain Course of the Indus and the Himalaya, North of the Panjab.* With a Map and other Illustrations. By G. T. Vigne, Esq., F.G.S. 2 vols. 8vo.—By the Editor.

However slow the progress of geographical discovery on the N.W. frontiers of India may appear, while our attention is fixed on the details of its creeping progress, a comprehensive view of its results shows that it has of late years been steady.

The information respecting these regions embodied in the map attached to the work of the Hon. Mountstuart Elphinstone was derived almost entirely from native routes. That map, and its explanatory memoir, will remain a monument of the industry and sagacity of its compiler, Mr. Macartney; and they have been the starting-point whence subsequent research has advanced—the point of view whence later explorers have taken their departure—as the 'Account of the Kingdom of Kabul,' to which they are attached, may be regarded as having given the first impetus to the progress in discovery since made in the regions to which we are adverting.

In 1811-12 Mr. Moorcroft crossed the Himalaya by the Niti pass, made his way to the great plain between it and the Kuenlun chain, examined the sources and upper courses of the Sutlej and the eastern branch of the Indus, and fixed the position of lakes Rávan and Mánasa. In 1820-22 Messrs. Moorcroft and Trebek, taking their departure from Mundi, penetrated to Ladak; explored the country northward to the valley of the western branch of the Indus, eastward to Chibra on the eastern branch, south-eastward to the valley of the Piti, an affluent of the Sutlej;

returned from Ladak to Kashmir by the pass of Duras; and descended to Rotas, on the Jylum, on their way to Attock. About the same time that Messrs Moorcroft and Trebek were exploring the plains of Little Tibet, and the countries farther eastward in the direction of the Oxus, the brothers Gerard were examining in detail the district which intervenes between the two routes of Moorcroft, as far as the impediments thrown in their way by the jealousy of the guards of the Chinese frontier would permit. They examined with scrupulous accuracy the valley of the Sutlej from above the Chinese frontier to where it issues from the mountains; connected thus the central scene of their admeasurements with the western route of Moorcroft, and pushed them on the E. to within less than 2° of longitude of his eastern route. From Attock, where we left Mr. Moorcroft and his companion, they pushed their way up the valley of the Kabul river and round the extremity of Hindu-Kush to the valley of the Oxus. They were followed by Sir Alexander Burnes in 1830, whose services to geography will be very inadequately appreciated if estimated only by the positive additions which he made himself to our knowledge. He had the rare merit of being able to stimulate others to the task of discovery—to take a comprehensive view of the results of their investigations—to point out where blanks had been left, and again urge on to fill them up. This praise is justly his due; but sufficient credit has not been given to his companion, Dr. Gerard, for the scientific accuracy which his assistance lent to the geographical information collected in Sir Alexander's Journey across the Hindu-Kush. Lieutenant Wood (one of those enterprising spirits whom Sir Alexander Burnes was instrumental in setting in motion) connected Kabul with the valley of the Oxus by a line crossing the Hindu-Kush, E. of Sir Alexander's route, and pushed his discoveries up the Oxus to where the northern branch of that river issues from the Sir-i-kol. It is not necessary for our present purpose to do more than allude to the services of Pottinger and Christie, Conelly and Masson, in exploring the scenes of geographical enterprise to which we have been directing attention, with the Indian Ocean, through the mountainous region W. of the Indus.

This retrospect was necessary in order to afford data for forming a just estimate of the service rendered to geography by Mr. Vigne's three volumes now under review. It has been confined to the efforts of British travellers, not from any desire to undervalue the important labours of Hügel and other continental men of science, but with a view to direct attention to the amount of discovery effected by British enterprise, under the favourable auspices of the Anglo-Indian government. The doubt and hesitation evinced by the British authorities in India when Moor-

croft undertook his first expedition have now entirely disappeared. The taste for geographical discovery (the passion, it might almost be termed) which this change has developed among our countrymen in the East is daily growing more intense and enlightened. It is upon this we build our hope that the progress which has been made between the journey of the Kabul mission in 1808 and the expeditions of Mr. Vigne and Lieutenant Wood in 1838 will be accelerated rather than diminished. The survey of India is the nucleus of the new geography of the East. The exploratory excursions of our adventurous travellers spread the circle of knowledge beyond our own dominions, the measurements of the survey supplying a known basis whence to start, and their familiarity with practical science affording a further guarantee for their accuracy. And beyond this region of day lies one of twilight (the information collected from natives respecting more remote regions), which every succeeding traveller will at once widen and remove to a greater distance.

We now turn to Mr. Vigne. His travels on the E. side of the Indus extend over a region, the eastern boundary of which is formed by Mr. Moorcroft's route from Mundi to Ladak; and the southern by the routes of Sir Alexander Burnes and the Hon. Mountstuart Elphinstone from the Sutlej to Attock. Taking his departure from Jamu, nearly in 32½° N. lat. and 75° E. long., Mr. Vigne traversed various routes to Kashmir and Tibet. One of these proceeds from Lake Mánasa: he passed by Ramnagur northward to the Chunab, up the banks of that river to Kistawar, thence northward along the valley of Muru Wurdwun to Wurdwun, and thence S.W. into the valley of Kashmir. A second proceeds from Jamu up the Chunab to a point on that river a little to the W. of where it is struck by the first route, and thence through the Pergunnah of Banihal to Kashmir. A third proceeds from Jamu, through Aknur, Rajawur, and Puneh, to Uri on the Jylum, a few days' journey below the pass of Baramula. Mr. Vigne also travelled along the road which leaves this third route at Thana, and leads nearly at right angles to it into Kashmir. From the valley of Kashmir he descended the Jylum to Mazufarabad, and crossed the country from that place to Attock. These lines he connected by cross-routes, which we here pass unnoticed.

The valley of Kashmir itself he traversed repeatedly in all directions. From Lake Wulur he crossed the mountains, and descended into the upper valley of the Kishengunga. From the source of that river he on two different visits penetrated to Iskardoh; crossing on the first occasion the high table-land of Deesih, on another threading the mazes of valleys which intersect the high land to the N. of it. From Iskardoh he ascended the valley of the Shighur northward to the first glacier at its head,

and crossed the country westwards to Acho on the Indus, whence he returned by the Astor or Huzarah valley to Zian on the upper Kishengunga. He ascended the western (or, as he calls it, the northern) branch of the Indus, from the junction of the two rivers above Iskardoh as far as Teukzi, and the eastern branch as far as Ladak. He crossed the high land between these rivers at two different places; once from Ladak to Nubra, and once about a degree of longitude farther W. He penetrated to the glaciers on the southern declivity of Mustak, due N. of Chorbut on the western Indus, and more than 3 degrees of longitude E. of the glacier at the head of the Shighur valley. Lastly, he travelled from the Indus to Kashmir on one occasion by the route of Duras, the road taken by Moorcroft on his way from Ladak. From Acho Mr. Vigne had an uninterrupted view down the valley of the Indus for a distance of nearly 40 miles, and up the valley of Gilgit (if we understand him aright) to above the station of that name. It is evident, too, that wherever he went he busied himself in collecting, comparing, and criticising native routes. From the mode of describing the results of his observations adopted by Mr. Vigne, it is not easy to say with precision how long they occupied him. He landed at Bombay in January, 1833, and sailed from that city in May, 1839. And the general tenor of his work shows that almost the whole of the intervening period was consumed in exploring the region to which we have stated his expeditions were principally confined. During that time he crossed and recrossed the scene of his observations in all directions, generally paying more than one visit to the most important places. His excursions extend from S. of the 32nd to near the 36th degree of N. latitude, and from about the 73rd to about the 77th degree of E. longitude. Kashmir is the central part of his operations; he visited it at the same time with Baron Hügel, and the contemporary yet independent labours of these gentlemen mutually add to our confidence in the reports of each. Between them and Trebek the valley of Kashmir may now be said to be known with a degree of accuracy that is yet a desideratum in the case of some European states. E. and N. of Kashmir Mr. Vigne has given us in detail what was left in a great measure a blank by Moorcroft. The narratives of these two travellers furnish us with the grand outlines of the whole river system of the Indus above Attock. On the N.W. little more than a degree of longitude and a degree and a half of latitude remain to be explored in order to connect the termination of Mr. Vigne's labours on the Gilgit and Shighur with the termination of Lieutenant Wood's at the Sir-i-kol. Between the river of Kabul and the parallel course of the Upper Oxus, and between Lieutenant Wood's route across the Hindu-Kush on his return and the

western boundary of Mr. Vigne's excursions, a space of about 5 degrees of longitude, and little more than 2 of latitude, intervenes, which, in so far as the personal inspection of European travellers is concerned, is an utter blank. Already, however, we are led to believe, from some valuable information regarding Afghanistan, in the course of publication in the Journal of the Asiatic Society of Bengal, the limits of this *terra incognita* have been invaded.

Mr. Vigne gives a number of heights observed for the most part with the thermometer. The map accompanying his Travels in Kashmir and Tibet is compiled from his MS. surveys. Having no means of testing the accuracy of his observations, it would be rash in us to pronounce a judgment on them; but, judging from the sketch map in his volume about Kabul, we should not place much confidence in them. This, however, we may safely say,—that his brief and unlaboured descriptions evince an eye for the picturesque effects of nature, which more perhaps than any other talent enables the traveller to convey a truthful impression of the regions he traverses—a candid yet cautious and reflecting spirit—and that he has taken all possible pains to learn as much as possible of the structure of the countries through which he passed, and the character and condition of their inhabitants.

In his volume on Kabul Mr. Vigne has given an interesting account—the first given by a European from personal inspection —of the route of the Lohani caravan from the Indus to Ghuzni.

It is with reluctance we advert to some discrepancies between the letterpress of the Travels in Tibet and the map which accompanies them. For example, we find on one occasion a route stated as seven days in the one and ten in the other; and the names are rarely spelt the same way in both. There is a very just remark made by Mr. Vigne at p. 114 of vol. i.:—"Whatever conjectures may be hazarded by fire-side travellers, we can determine nothing with certainty [respecting the identification of ancient sites] until the whole of the mountain country on the Kabul river, and intervening between Kafferistaun and the Indus, be thoroughly known." This, we would whisper, is equally true of other countries, and might be attended to with advantage by more enterprising persons than "fire-side travellers." And we may add, that a thorough knowledge of the ancient authors who describe or mention the sites is quite as necessary as a thorough knowledge of the countries.

MISCELLANEOUS.

I.—*Notes on South America and Oceania.* From Communications by General W. Miller.

Chili.—Dr. Weyman, a protégé of Baron Humboldt, and a fellow-passenger, tells me that Chili is to a mineralogist or geologist one of the most interesting countries in the world, and that her botanical productions are, although less numerous, less known than those of Peru. He says that the province of Copiapo is in a state of constant agitation from earthquakes, and that the whole face of the country is progressively undergoing most interesting changes from these convulsions. He states that this is the case, more or less, throughout Chili; but that, unless scientific persons are present to observe and compare the extraordinary effects of these convulsions of the earth, much will be lost to the scientific world. According to the Doctor, Valparaiso and most part of the coast of Chili have risen several feet from the level of the sea of late years. This accounts for two streets having been gained on the ocean in that city since I first arrived there, in 1817. The water is very deep close to the beach all round the bay. When at Valdivia, in 1820, we observed that there was only 2 feet of water where six Dutch line-of-battle ships had anchored sixty or seventy years before. The rivers of Birbir and Imperial are now scarcely navigable for boats at their mouths, whereas, when Ercilla wrote his 'Araucana,' 300 years ago, large vessels sailed some distance up those streams. The Doctor assures me that Lake Titicaca is 12,100 feet above the level of the sea, and the Ceno de Toledo, between Arequipa and Puno, is 17,200.—(Note made during my voyage from Peru to the Sandwich Islands in 1831. W. M.)

Indios Bravos.—Passing over a mountainous country for about 30 leagues due E. of Cuzco, the traveller reaches the summit of the eastern ridge of the Andes, whence he descries at their immediate base a few cultivated spots, or what is called el Valle de Pancartambo. Beyond this expands an apparently endless space of country, so covered with primeval forest as to be all but impenetrable, and so intersected by mountain-torrents—forming tributary streams to the Amazon—that the inhabitants,

called *Indios Bravos*, were never subjugated by the Incas of Peru, nor by the Spaniards, nor by any other race of men. Indeed no Christians have ever penetrated more than 10 leagues direct from the eastern foot of this ridge of the Andes into the wood-and-water entangled fortresses, which spread over hundreds of miles between the confines of civilized Brazil and the confines of civilized Peru.

In 1780 a Spanish subdelegado (or governor of a province), named Landa, advanced with 100 well-armed soldiers and pioneers a distance of 8 or 10 leagues, but they were speedily driven back by hordes of naked foresters, whose only offensive weapon was the bow and arrow. No second attempt, that I could learn, had been made until my own excursion in 1835, as described in my 'Notes.'

The *Indios Bravos* are perhaps the only numerous body of the primitive race existing in the New World who have never been subdued by, nor partially amalgamated with, civilized tribes, nor brought into permanent contact with Europeans by the aid of missionaries, traders, or otherwise.

These Indians of the forest live chiefly on game and fish, both of which they shoot with bows and arrows. They, however, cultivate maize, yams, and a few other esculents, but eat no salt. They wear no clothing *of any description whatever*, excepting a broad leaf which some of the females occasionally use for a time. Polygamy exists, but it seems that the women, like those of the ancient Germans, are, from inclination or fear, faithful to their husbands.

The *Indios Bravos*, I think, from what I saw of them, bear a closer resemblance to the Indians about New Orleans, to those of the Six Nations near Buffalo, and to the Pahmenakes occupying the gorges of the Andes in the latitude of Concepcion, than to the civilized Indians of Peru—that is, the descendants of those first subdued by the Incas, and then conquered and converted to Christianity by the Spaniards.

In my Notes on the Sandwich and Society Islands, it is shown how easily Chinese or Japanese junks, blown away from their own shores, might have been the accidental means of a more intelligent race being drifted on the W. coast of America, and hence perhaps it is that so much analogy to the Eastern nations is traceable in Mexico and Peru. (No date.)

UNDISCOVERED ISLANDS IN THE SOUTH SEA.—That there are several islands still undiscovered in the South Sea no doubt can be entertained; and I feel persuaded that there is a fine field of discovery between 18° and 30° of S. lat. and 110° and 135° of W. long., which is a tract of ocean seldom traversed by any vessels. Those that go from the western coast of the American

continent to the W. steer a course at most 18° S. of the line, and generally more to the N., to ensure a good trade-wind, which loses much of its strength to the southward of 12° S. lat. Vessels coming from the W., India, China, Manilla, &c., get into 35° S. lat. as soon as they can, unless they are bound to the coast of Mexico, and then they keep far to the N. Whale-ships that come round Cape Horn run down along the coast to Galapagos and California, and on their return home seldom go farther to the W. than 110°. If they proceed, as they usually do, from the Galapagos or California to the Sandwich Islands and Coast of Japan, then to re-double Cape Horn they hardly ever get farther to the E. than 140°, until they reach 30° S. lat. Ships sailing from the Sandwich Islands, bound home or to the South American coast, never weather—that is never pass to the eastward of—the Society Islands, which are in about 140° long., but strive to make a due S. course until they get into 30° or 35° S. lat.

The Sandwich Islands, from their geographical position, their fertility, salubrious climate, and safe, commodious ports, are of considerable importance. Honolulu, the capital of Waohu, is already an entrepôt for European and Indian goods, whence they are re-shipped to the new States of Spanish America. It is a general rendezvous for most of the whale-ships. Sometimes eighty sail of them, each of from 300 to 500 tons, are at anchor there for months at the same time. In 1835 the amount of imports at Honolulu was 300,000 dollars; of exports 620,000—320,000 being foreign produce, and 300,000 native produce. At Byron's Bay, in the Island of Owhyhee, there are saw-mills. There are also on the same island immense hills of sulphur—the volcano of Kilaen being in constant action and the largest in the world. (From a letter dated 'Lima,' July, 1834.)

II.—*Notes on Northern Australia and the neighbouring Seas.* From Letters of Mr. G. W. Earle.

Natives of the North Coast of Australia. *Vittoria, July* 13, 1840.—The Bughis consider the N.W. coast as a distinct country from the N. coast. The former they call Ki-Java, the latter Maregé. I think I told you that old Bassa Padu left a man with us last year as interpreter with the natives. He has done well for himself, and returned this year to Macassar. He lived three months with the natives of the interior, who are very different from the natives of the coast, and perhaps will be found to be Arasuras. This is a point we must clear up soon, although it will be attended with some danger, for, like the Arasuras of New Guinea and Timor, they avoid strangers with the most ridi-

culous anxiety. I mentioned to you in my letter from Sydney the way in which they trade with strangers on the N.E. side of Timor. The natives about us are looked upon as savages by the people of the interior, according to the man Timbo's account. All the clothes, iron, axes, &c., that the natives of the coast have taken from us goes into the interior, and I cannot discover that they get anything in exchange but spears, and perhaps food. The Macassars, although nearly all the natives on the coast speak their language, know even less about the natives than we do, simply from their not taking any trouble to inquire. You ask for vocabularies. I am in the most ridiculous perplexity about them. After having collected many words, I found that I was making a vocabulary of a horrid *patois* of the Macassar dialect: in fact, nearly all the words the natives use when speaking with us are Macassarese. I am beginning to think that the distinction between native races—that is to say, those in a state of barbarism, like the people of Australia and New Guinea—will be best discovered by a comparison of their pronunciation; for even in the Cobourg peninsula the dialects differ, although the tribes are able to communicate with one another, either by means of one common language or by their understanding one another's dialects. Now the natives of the Arasura Islands, though speaking dialects, a specimen of one of which I send you, in which scarcely a single Malay word is to be found, readily acquire a perfect knowledge of the Malay language, with a correct pronunciation, although the learner be far advanced in years, while the natives of Australia make the most shocking jargon of it: witness a specimen:—Macassar is pronounced Munkajerra; Karadz, Karridja; Bras, Bareja; in fact, they can neither pronounce the letter s nor the letter f. This would lead us to suppose that the Australians cannot be of the Oceanic race, as some have thought them to be.

Sandal Wood Island. *Vittoria, July* 13, 1840.—I have gathered much information concerning Sandal Wood Island from two persons well acquainted with it, one of whom has visited it several times, during which he made an excursion down the entire E. side of the island by land. The population is very large, the natives bearing great resemblance to the Javanese, not only in personal appearance but in habits and mode of life. Horses and cattle are in great abundance, the former being much esteemed for their bottom. The land is tilled by the plough, drawn by bullocks, not buffaloes; their mode of culture and everything appertaining to it resembling that of Java. The country too resembles Java, and a very large portion of it is cultivated. For its beauty I can myself speak, having passed along the S. coast in the Aligator.

Gulf of Carpentaria. *Port Essington, June* 9, 1841.—The Prahus came in earlier than usual this year, and, I am sorry

to say, brought more goods than we had money to purchase. Among the Nakodahs was one whose Prahu had been driven past the Wellesley Islands (the usual limit of their voyage) by a strong N.W. wind into the bottom of the Gulf of Carpentaria, where she was anchored in 1½ fathom on the mud bank, the low land barely visible to the eastward. Here he found the water so fresh that he filled up his water-casks alongside the Prahu. On making inquiries of the old Nakodahs, I found they had nearly all at different times experienced the same thing. In fact, from this circumstance they call the sea to the E. of Wellesley Islands the "Eyer tawar," or fresh water. There must be a considerable body of water poured out here during the rainy season to render the sea fresh so far out.

The Prahus, when going into the Gulf of Carpentaria, do not go round by Wessel Island, but pass through a strait, the western entrance of which is the opening marked in King's Chart in lat. 12°, long. 135° 55'. The eastern entrance is somewhere about Probable Island. Flinders (vol. ii., p. 230) mentions that, while lying at the East India Company Islands, he saw the Prahus coming in from the S.W.; these must have passed through the strait. It is called "Selat Labu," or Anchoring Strait, by the Macassars, being the first anchorage of the Carpentaria Prahus on the coast. This part of the coast is apparently the termination of a granite range, and is said by the Macassars to abound in minerals, among which they mention *tin;* but the only specimen I have, which I will send you by the first opportunity, appears to me to be antimony-ore, which will yield perhaps two-thirds of its weight in metal.

The Macassars tell me that, after the S.E. monsoon has set in strong, numbers of cocoa-nuts are driven on shore, about Blue Mud and Caledon Bays, and that from their fresh appearance they do not seem to have come from a great distance. They could scarcely come from Torres Straits, as the wind and course of current would scarcely permit this. Can there be any islands in the Gulf of Carpentaria that are not yet known? The centre of the Gulf has not yet been traversed to my knowledge. Flinders (vol. ii. p. 125) thought, from some flights of ducks that he saw coming from the westward, when near Batavia Roads, that some island probably existed in that direction. I think I mentioned to you the case of a Prahu, that was driven from Timor Lant by a strong N.W. wind two years ago, having drifted to an island that abounded with cocoa-nuts, and was uninhabited. All these circumstances render the point one of great interest.

We have discovered a large bawau-tree in a thicket near Knocker's Bay, which the natives hold in high veneration, and call it the Tree of the Spirit, by whom they suppose it to be inhabited.

III.—*Letter from Dr. Dieffenbach, describing the present state of Te Wanga Lake in Chatham Island.*

[In Dr. Dieffenbach's paper on the Chatham Islands (Jour. Roy. Geo. Soc., vol. xi. p. 204) he mentions that the Te Wanga lake, which was completely isolated from the sea at the time of his visit, at other times discharged its waters into it. It appears, by the following letter from that gentleman to the Secretary, that the communication between the waters of the lake and the sea is now permanently established.]

Dear Sir,—A fact has just come under my notice regarding the geography of Chatham Island which is of some interest. as showing one of the many ways in which the configuration of countries may be modified.

The large lake of Te Wanga, which, as I stated in my communication to the Royal Geographical Society, occupies an extensive portion of the island; and which at the time of my visit in 1840 was separated from the sea by low sandhills, and about two feet above high-water mark; had filled again during the last year (1841) to such an extent, that a break took place, and the outpouring water formed a broad communication between the sea and the lake, carrying away many thousand tons of sand, and forming a channel that appeared accessible to boats. But a boat which tried to enter this new bar-harbour was upset in the heavy surf, and six people were drowned.

By this outbreak the size of the lake was at first remarkably diminished. Easterly gales, however, which subsequently set in and continued for some time, drove a vast quantity of water from the sea into the lake: its surface is now on a level with the sea, its water partakes in all the movements of the tide, and yet the surface of the basin is actually much larger than it was before.

At the time when the agent of the New Zealand Company, who was living in Chatham Island, left that place for Wellington (I think, in September last), this state of the lake, now more properly an "inlet," remained unaltered.

I am indebted for this communication to Mr. Heaphy, the draughtsman of the New Zealand Company, who has lately returned from New Zealand.

January 13, 1842.

PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY

I.—*Narrative of a Survey of part of the South Coast of Asia Minor; and of a Tour into the Interior of Lycia in* 1840-1; *accompanied by a Map.* By Rd. Hoskyn, Master of H.M.S. Beacon, under the directions of Commander Thos. Graves.

I.

On the 26th of November, 1840, I sailed from the harbour of the Piræus in the Isabella decked boat, with Mr. Harvey, assistant-surgeon, and a crew of eight hands, for the coast of Asia Minor. We took as much provisions as we could carry, and had a four-oared boat in tow. After a long and tedious passage, during which we encountered some severe gales, we arrived at Rhodes on the 14th of December.

Our survey commenced near the harbour of Karaja-agach, a Cape Kizil-burnu. Rounding it, we came to the bay of Koi-gez, which has a snug little cove in its N.W. corner, where vessels visiting this coast in winter receive their cargoes. Near the shore, in the middle of the bay, is a small island, and close to it the mouth of a river, entering which we observed on the hills on our left the walls of a considerable city. These with the rock-tombs are conspicuous objects from the sea; the walls enclose a considerable space, commencing at the port and extending over the hills until they terminate on precipitous cliffs which overhang the river. On the low land near the port they are built in the usual Hellenic style, but towards the summits of the hills they are of the most ancient Cyclopean form. The theatre is in tolerable preservation; it is of inferior workmanship, has thirty-four rows of seats divided by a diazoma, and faces the sea; it is partly excavated out of the Acropolis hill. On the low ridge which connects the neighbouring hills with the Acropolis are the ruins of baths, temples, and an aqueduct; also what appears to have been a Christian church, and another building of the same or a later age, erected on a platform formed of columns, and other remains of ancient buildings. To the S. of this is the ancient port, now a swamp, and nearly two miles from

the sea. On the N. side of the ridge are considerable ruins of the middle ages overgrown by thickets; the base of the Acropolis hill is washed on the N. side by the river. Its summit is crowned by a fortress of the middle ages. The rock-tombs are much in the same style as those at Mákri. We did not observe any sarcophagi. The only inscription we found fortunately assures us of this city's having been Caunus; there might otherwise be some difficulty in reconciling its position with that assigned to Caunus in the Stadiasmus. Its natural features are quite in accordance with the description given of it by Strabo; the port already spoken of must have been very snug, and easily closed against an enemy, while the extensive marsh E. of the city would account for its proverbial insalubrity. The fort Imbrus may have occupied the summit of the hills over which the walls now extend; and the river which flows past it, adding so greatly to its defences by meeting the walls at each extremity, may probably be the Calbis, near which Caunus is said to have stood.

On the banks of the river adjoining the ruins is a considerable fishery, and a small village named Palyani: great quantities of botarga are prepared here; the fish are salted, and sent to Rhodes and the neighbouring islands; small kaiks ascend the river as far as Palyani, where they receive cargoes of wheat, sesame, maize, &c. The winter freshes having broken down the weirs, we were enabled to proceed up the stream. Passing under picturesque limestone cliffs whose bases are washed by the river, we came to a considerable lake, at the N.E. extremity of which is the village of Koi-gez. There are no remains of antiquity here; the village is the residence of an Agha, whose house or palace is on a very large scale, although it appears to be in a ruinous state now. Adjoining the shore is a small island inhabited by Greeks: there are two other islands in the western part of the lake; on the smaller are ruins of the middle ages. The lake is 6 miles long, and about 2½ wide; it varies from 3 to 13 fathoms in depth; its waters are brackish. A small river named Yuvalaki empties itself on the S. shore; this is the only perennial stream. In winter the lake receives a number of smaller torrents, and the plain which separates it from the sea is completely inundated. The lake is bounded on the E. by a range of limestone mountains, beyond which are the plains of Tàlamàn.

The bay of Tàlamàn is separated from that of Koi-gez by a high bold promontory named Kapanya, on rounding which an island will be seen, whose towering cliffs are crowned by a large brick pyramid; there is anchorage under this island for small vessels. On the adjacent coasts are extensive ruins of the middle ages, and also some foundations of Hellenic buildings. The summit of a low hill is encircled by a wall of the same kind; this

is probably the site of Písilis. One mile and a half to the S.E. is the mouth of a large and rapid river known as the Tàlamàn Chai, probably the ancient Indus. We inquired for ruins, hoping to find those of Calynda in this neighbourhood, but could not hear of any; at the village of Tàlamàn we were equally unsuccessful. This village is now of little importance; it is the residence of an Agha, who formerly enjoyed some consideration, and is situated at the foot of the mountains on the E. side of the plain, 5 miles from the sea. The plain is extensive, and apparently fertile, but there is little cultivation; numerous flocks were grazing on it. There are many ruins of large buildings which we were told had been the residences of Beys. Near the shore in the S.E. part of the bay of Tàlamàn is an ancient site: we observed many foundations, and some fragments of columns. From its vicinity to Cape Artemisium this may possibly be the site of the grove of Latona; within it, on the land side, is a small lake which appears to have once been a harbour. Five miles S.E. of this is Cape Artemisium, now called Cavos Suvelah, and near it the islet Paximathi; 5 miles N.W. of the latter is another islet named Rothea.

Cape Artemisium is a rugged and bold promontory, nearly insulated; there is a modern wall across the narrow isthmus which connects it with the mainland; its shores are much indented; within it are several snug harbours, all too deep for anchorage excepting the little harbour of Kappí. A narrow but safe channel separates the island Nero Nisi from the N. projection of the Artemisium promontory. Next Nero Nisi is the island of Tersanah; a long and narrow channel separates them. This island is very fertile, supporting numerous cattle; it abounds also in partridges; being so near the mainland it is much infested by jackals and other wild animals. It is steep and rugged all round; on its summit is a small fertile plain. The tobacco produced here is of superior quality. On the N.E. side of the island is a snug little harbour, and a Greek village surrounded by ruins of the middle ages; and on a hill over the harbour are the ruins of an Hellenic fortress. These islands are probably the ancient Carysis and Alina, which geographers assigned to Crya.

In a small bay of the mainland to the N. of Tersanah, on the side of a steep hill, are a few rock-tombs and remains of an Hellenic fortress; this is probably Crya. On a Lycian tomb we copied the annexed inscription, No. 2.

To the N. of Tersanah are several small islands and rocks, known to the Greeks as Stavro Nisia, or the Cross Islands. N. of this is Agio Kisiachi. All these are of serpentine, and afford pasture for a few goats. The space within them, known as the

gulf of Scopea, is a fine and well-sheltered sheet of water, but it is much too deep for anchorage. Every island, bay, and creek in this gulf has ruins of the middle ages. In the N. part of the gulf of Scopea is a small harbour called Coujek Limani: the western cove is well sheltered. The village of Coujek is at the foot of the hills at the head of the plain; fresh provisions may be occasionally procured here. Two miles and a half S.E. of this is a rugged cape, near which a small stream, Iniji Chai (probably the ancient Ninus), empties itself; the valley through which it flows is highly picturesque and well cultivated. On the mountains on the W. side of the valley is an ancient site, probably Dædala: here are numerous tombs hewn in the rocks in the usual Lycian style; some are well finished. The acropolis stood on a detached hill; on its summit are remains of wells and a large cistern. We did not find any inscriptions. From Iniji Chai the coast trends to the S.E.: the serpentine hills which line this part of the coast terminate on the shore in stupendous cliffs. During the winter numerous small streams descend from them to the sea. The island Avthokea is off this part of the coast; it is rocky and barren, and affords pasturage for a few goats. To the S.E. of it are several rocky islands called Kazíl Ada; a few goats are fed on the largest; numerous pigeons inhabit the cliffs. The space between these islands is a secure anchorage. Abundance of fresh water may be obtained from a stream on the mainland.

The harbour of Mákri is perfectly secure, and well sheltered from all winds. Cavalier Island, called also Palaio Mákri, lies across its entrance; it is covered with ruins of the middle ages. There is a passage to the harbour on each side of it; the S. one is the best. The eastern shores of the harbour are low and marshy; the scala is on the S. shore in the midst of a marsh; it is a wretched collection of hovels surrounded by the ruins of the ancient city of Telmissus, and so unhealthy that no one can reside in it during the summer months.

There are but few remains of the ancient Telmissus; of these the tombs are the most remarkable; those hewn in the rocks in imitation of porticoes with Ionic columns, doors, and pannels, finished in the most elaborate style, excel everything of the kind I have seen. There are a great variety of others; one sarcophagus is now standing in the sea about 20 yards from the adjacent swamp. The large theatre is close to the sea. I think I have discovered the site of a smaller one on the N. side of the Acropolis hill, where there are traces of the seats excavated in the rocks, but the masonry has entirely disappeared. The adjacent hills are covered with excavations, proving that the city must have covered a considerable extent. There are no traces of its walls or temples.

The town of Levisey is about 3 miles to the southward of Mákri: it contains 500 houses, and about 380 families; it is inhabited solely by Greeks, and situated on the S. side of a rich and well-cultivated plain, which produces good wine and figs. There are some small Turkish villages on the borders of the plain; one of these is the residence of a Muhassil, whose jurisdiction extends from Koi-gez to Kunik. The whole district is in the pashalic of Mughlah.

The coast to the southward of Mákri is high and bold. Rounding Cavos Augistro we come to the island Kakazorane, which is covered with ruins of the middle ages, as is also the island of St. Nicolo. There is good shelter for small vessels inside the latter; the little port of Simbalú affords secure anchorage in all weathers; the entrance is about 100 feet wide, with 18 feet water. Passing the low sandy spit which forms the harbour, you enter on a large sheet of water, with a depth of 20 fathoms; this is the port of Levisey. Near it are extensive ruins of the middle ages. At this place our survey of the coast terminated.

Being in want of provisions we proceeded to Marmaras to procure them from the English squadron assembled there. On the western shore of the outer bay of Marmaras, near the entrance of the harbour, is an ancient site named Assaijik, probably the ancient Samus; it stands on a bluff point of land, with some highly picturesque mountains behind it. The ruins are of small extent; the city walls, a small theatre of rude architecture, and some platforms are all that remain. Near the city is a large excavation in the base of the mountains; the hills behind it ascend by terraces; this is probably the spot Dr. Hume alludes to in his description of Marmaras.

There are two channels to the harbour; the eastern is the best, though too narrow for a large ship to work through: on the summit of the island that forms these channels are the ruins of a castle of the middle ages; the harbour is sheltered to the S. by a high peninsula, which is connected with the mainland by a low shingly beach.

On the summit of the peninsula are the ruins of an Hellenic castle. On entering the harbour a fine sheet of water presents itself, surrounded by bold mountains, which towards the N. and W. recede from the shore, leaving a narrow valley between their bases and the sea.

At the period of our visit the scene was enlivened by the presence of the English fleet of fifteen sail of the line, under the command of Admiral Sir Robert Stopford, and the Austrian squadron, lately returned from their brilliant operations on the coast of Syria. The little town situated in the N. part of the bay, which, during the Beacon's visit in 1838, was almost de-

serted, was now thickly inhabited, and, by the erection of sheds and other temporary dwellings, increased to double its usual size. A ruinous castle crowns the summit of the rocky peninsula on which it is situated: this is said to be the site of the ancient Physcus, of which there are no remains.

On the appearance of such a fleet as we found assembled there, the whole neighbouring country is put in requisition to supply its wants; vegetables are procured from Rhodes, and there are many petty traders who find it worth their while to go as far as two or three days' journey into the interior, for bullocks and other live stock, which they drive down to the nearest part of the coast and bring in kaiks to Marmaras.

Before the expedition to Egypt rendezvoused here in 1801, the harbours of Marmaras and Karagach were scarcely known. Now that an accurate survey of this coast has been completed, the seaman may fearlessly run for any part of it, certain of finding shelter in any of its fine harbours, and such supplies as the country affords. The literary traveller may trace his route with accuracy, and, comparing his observations with those of the ancient geographers, arrive at more certain conclusions respecting the many interesting sites which occupy these shores. Cape Marmaras is 17 miles N.N.E. of the N. point of Rhodes.

II.

On the 5th of March, 1841, I left Mákri accompanied by Mr. Harvey, on a trip to the ruins of Xanthus. Wishing to make all the additions in my power to the geography of the country, and not being aware that Mr. Fellowes had already been over the ground, we took the circuitous route by Huzumli, where we were told there were ruins. The village is situated at the E. end of a well-cultivated plain of considerable elevation, which we entered from the plain of Mákri by a pass called the Charchu-boghaz. Huzumli is 5 hours from Mákri.

On a mountain near the village are the ruins of a Greek city. Approaching it we observed numerous tombs excavated in the rocks, but which had been thrown out of their original positions by the violence of earthquakes, some of them in large fragments of rock quite entire. One, a sarcophagus, highly ornamented, which has been removed from its original site in an entire state to a considerable distance, now lies, with the large mass out of which it has been hewn, at the head of a ravine, inclined at an angle of about 30°, apparently waiting for the next shock to precipitate it to the bottom. The only approach to the city is by a path of steep ascent; it is surrounded by cliffs on the W. side, and is very steep all round: the first object which attracted our attention on entering it was a heap of ruins, apparently of a temple: there are

fragments of many columns, some fluted, others plain, but I could discover no capitals by which the order of its architecture might be ascertained. Adjoining it on the E. are the foundations of a large square building, enclosing a space filled with cisterns; to the S. of it are the ruins of a palace. The theatre is on the S. side of the city; it commands a view of the plain and harbour of Mákri, with Mount Cragus rising behind them; it is small and in tolerable preservation, better indeed than any other object here; it has eighteen rows of seats, and is about 125 feet in diameter; the back of the upper row has an inscription, much obliterated by the decay of the stone; the same cause makes it extremely difficult to decipher any of the inscriptions which are found on the tombs. Mr. Fellowes has ascertained it to be the city Cadyanda; an inscription lately found in a Turkish burying-ground on the plain of Mákri, by the Rev. E. T. Daniell, and which was probably brought from this place, gives it the same name. The city wall in the neighbourhood of the theatre is in good preservation; the different stones are fitted into each other, not in regular layers, and grooved at the edges. From the appearance of its remains it has probably been inhabited by the Romans, and in the middle ages.

On leaving Huzumli we descended through a ravine in an easterly direction to the valley of the Xanthus. Travelling along the banks of the river we passed the village of Sedeler, and crossed the Xanthus by a substantial stone bridge of five arches, a convenience not often enjoyed in Turkey; it was built about fifty years ago, by a pasha of Algiers, named Hassan Pasha, a native of Duvah, which place he left when a youth in indigent circumstances. On the attainment of riches and power he did not forget his native country; this bridge, with the mosques of Huzumli and Mákri, are the fruits of his liberality. After crossing the bridge we continued along the left bank of the river, passing the village of Kebeler, a little beyond which is a hot spring, the sulphureous fumes of which taint the air to a considerable distance; persons afflicted with cutaneous diseases repair here to bathe in it. In the evening we arrived at the lower village of Duvah; it is nine hours from Huzumli.

The ruins of Tlos are one hour's distance from the place we lodged at. Part of the village of Duvah is built among the ruins and on the Acropolis hill; it is a most delightful situation, elevated 700 or 800 feet above the plain, which, with the river meandering through it and the high mountains of Cragus in the background, forms one of the finest views imaginable; in its rear are the snowy mountains of Massicytus; the sea is just visible to the southward; on the N. the view is bounded by the snowy summits of Taurus.

The principal ruins of Tlos are its tombs and the theatre; of

the former, those hewn in the rocks are the most remarkable; the others are the ordinary sarcophagi, some of which are placed on huge pedestals of rock about 12 feet high. The theatre is about 200 feet in diameter, and has thirty-four rows of seats; it is now entirely filled with brushwood, which quite destroys its appearance; it is in tolerable preservation and highly ornamented; the lower part is excavated, and the upper built on immense arches; it faces the acropolis, where there were probably temples. The walls of the acropolis have been rebuilt with the ruins of the temples and seats of the theatre. There are many columns and friezes scattered about, but it is difficult to decide on the sites of the temples. Here are also some immense buildings of a later period, probably Roman.

Our guides refused to take us to Xanthus by the left bank, as they feared crossing the Mangher Chai, which they represented as more dangerous than the Xanthus river. I have since crossed it with great ease; it is not deep, but very rapid; it flows over a bed of clay, in which it is said there are deep holes, which make it dangerous. We took the route across the valley, and forded the river near Sakalah Koi; here it is about 100 feet wide and very rapid; the water came up to our saddle-girths: a countryman acted as our guide, who took the leading horse by the bridle, keeping its head up the stream; he was amply rewarded for his trouble by a backsheesh of two piastres. Our route now lay over low wooded hills, among which we observed abundance of valonia; on approaching Kunik the valley contracts, and the river flows between steep banks, and sometimes under precipitous cliffs. It was understood that we should have again forded the river near the ruins of Xanthus, but our guide took us to a very difficult ford, and in our ignorance of the country we were obliged to submit to him. It was therefore arranged that we should sleep where we were that night, and be carried over on the following morning. In the mean time I went to see some ruins said to be at one hour's distance; I found a large theatre in very good preservation, built in the side of a low detached hill. Near it on the plain are the foundations of a temple, probably the temple of Latona. A few sarcophagi are scattered about. The theatre is of rather unusual construction, the sides being parallel, as in the theatres of European Greece;* the proscenium has quite disappeared; over the north vomitorium are some bas-reliefs of faces, representing laughter and grief in various stages.

We were carried across the river on men's shoulders, an unpleasant mode of conveyance for those unaccustomed to it. Half-an-hour's walk along the banks brought us to the ruins, of which

* See Leake's Asia Minor, p. 322, l. 4 et seq.

I shall now say nothing, as they have been so fully described by Mr. Fellowes. Our principal object being to map the country and to collect geographical information, the position was accurately fixed and a plan made of the ruins.

The next object of our attention was Pinara. Turning off the direct road to fix the position of Sidyma, the ruins of which I regret I had not time to examine, we arrived in the evening at Minara; it is prettily situated at the head of a little valley. We were better lodged here than usual, in a sort of khan, for which we were expected to make an acknowledgment; but the native travellers were both lodged and fed gratis. On the second night our apartment was shared with a traveller from Denizli, who had come here to purchase oxen; the bullocks of this country being esteemed very strong and well adapted for draught. They are, however, very small in comparison with our English breed.

The morning after our arrival we went to see the ruins, which are one hour distant to the westward of the village. On approaching it we were much struck by the grandeur of the scene. The city is situated at the bottom of a deep gorge; a stupendous cliff rises behind it, whose surface is filled with tombs, which at a distance appear more like the burrowings of some animal, their number is so great: the peaks of Cragus tower majestically behind it. I think the approach to this city. when the view first bursts on one, is the finest combination of scenery I have seen—finer even than Tlos, which has many beautiful points, but not of so romantic a character as this. The ruins cover a large extent of ground, consisting of sarcophagi, temples, a theatre, and more modern and less substantial buildings, mixed together in indescribable confusion: many of the rock-tombs are highly finished, and deserving the greatest admiration. I regret that I have neither the learning nor ability to investigate these interesting objects; but as the valley of the Xanthus has now been thrown open by the indefatigable researches of Mr. Fellowes, and the intercourse with Europe by means of steam-navigation is so frequent, it is to be hoped that its antiquities may be fully explored by those whose previous acquirements have fitted them for the task.

From Minara we returned to Mákri. Passing over the roots of Anti-Cragus, we observed in some parts the earth terraced up on the sides of the mountains, now neglected and uncultivated, but showing the labour and industry once employed to raise food for the redundant population of the neighbouring cities, and offering a sad contrast to the present state of the country, where the large rich plains are almost entirely uncultivated. On small spots near the foot of the mountains corn is generally grown, and in the low swampy situations, which may be easily irrigated by neigh-

bouring streams, Indian wheat is cultivated, but there are no laborious agricultural operations. What Nature freely gives the inhabitants are contented with; and, being so, they are placed in an enviable position when we compare their condition with that of the people of more civilised regions. It is nine hours from Minara to Mákri. Horses and guides may be obtained at the latter place from October to May.

May 21st.—We rejoined the Beacon at port Naussa, island of Paros, after an absence of nearly six months.

III.

October 7th.—I again left the ship in the Isabella to finish our work on the coast of Asia Minor. On this occasion I was accompanied by Mr. Forbes, who had lately joined the ship as naturalist.

We first visited the bay of Kalamaki, where we discovered an aqueduct which has not been noticed by former travellers: it conveyed water to Patara, passing over the hills on the W. side of the bay of Kalamaki, where it appears to have answered the purposes of defence also. The wall is a fine example of the Cyclopean order, about 20 feet high, entered by two narrow doorways; the water is conveyed over it through hollow stones. After fixing the mouth of the Xanthus, and dredging off it, we proceeded to Mákri to make arrangements for another tour into the interior of Lycia. Mr. Forbes's immediate object being to illustrate the natural history of the country, and mine to add to the knowledge of its geography, we consulted the natives with respect to our route, and agreed on one which was reported to have many interesting objects of attention, and which did not appear to have been travelled by Europeans.

We left Mákri on the 22nd of October, and, crossing the Xanthus by the bridge, reached Kungelar on the evening of the same day. This village is situated at the foot of the Massicytus mountains: its inhabitants had not returned from the Yailah or highland districts: it is seven hours distant from Mákri.

On the following morning we left Kungelar on the route to Almalí. The road for the first two hours wound up a ridge of sandstone, which descends from the Massicytus mountains. On attaining the summit the view opened on a wild glen, through which a torrent flows which joins the Xanthus near Kungelar; here are the ruins of a small city, romantically situated in the midst of the finest mountain scenery. It was probably an important post, as it commands this great pass to the interior country. On approaching it we observed several sarcophagi of the Lycian character; over a tomb hewn in the rock is the figure of a lion: the space within the walls is small, and contains

nothing of interest. We did not find any inscriptions to the N.E. of this. Near the village of Koi Kaghe are other ruins, which we did not visit. We continued our journey by a very rugged path along the steep side of the mountain: the road has been destroyed by a land-slip which occurred about three years ago. At sunset we descended into the ravine, and pitched our tent near a mill.

From the mill we ascended the mountains to visit some ruins: they are of small extent, probably a mountain fortress; on two sides is a very strong wall, on the other an inaccessible precipice. There are a few sarcophagi on a hill opposite the fortress. We continued our ascent until we had attained the summit of one of the peaks of Massicytus, which enabled Mr. Forbes to make many interesting additions to his collections in natural history, and at the same time gave me an opportunity of fixing our position and gaining much useful information for constructing a map. The peak we ascended is 9000 feet above the sea level: from it we had a very fine view of the bay of Macri, and the plains of the Yailah country towards Almalí. The highest peak of Massicytus, which is 10,000 feet high, rose far above us to the southward; some snow was still contained in its ravines, although exposed for so many months to the sun of this warm climate.

Monday, October 25th.—We continued our journey; in two hours we arrived at the summit of the pass, and soon after commenced our descent into the plains. On the road we passed a sarcophagus of conglomerate, of a very ancient appearance; around it are abundance of hewn stones, perhaps the ruins of a fortress.

We met with many caravans going from Almalí to Mákri; they were chiefly laden with wheat: the price of carriage is 10 paras per oke. The journey occupies about 2½ days. We were told that in winter this road is impracticable, and that the Yailah country is then entered from the neighbourhood of Kunik. The pass through which we travelled presents many points of very fine scenery: I should suppose the highest part of it is about 7000 feet high. At 2h. 30m. P.M. we arrived in the plains, and pitched our tent in the village of Chiflik Ayvasil. We had no instrument to ascertain the elevation of these plains; judging from the height of the peak we ascended, which we were enabled accurately to determine, they cannot be less than 5000 feet above the sea level.

Hearing there were some ruins on the opposite side of the plain, we crossed over in a S.E. direction to the village of Armutlu. At this season, when all the vegetation is burnt up, the plain has a very barren appearance; there are few trees on it,

excepting in the vicinity of the villages, where are some clumps of poplars; and near the fountains poplars and willows are reared to afford a shade. About half a mile S.W. of Armutlu we found the ruins we had been directed to; the site is such as the Greeks usually selected for their cities, a detached hill on the borders of an extensive plain. A substantial wall of the middle ages, built of fragments of the ancient city, encloses a portion of the site: a few broken sarcophagi are the only remains of antiquity. We did not find any inscriptions, temples, or a theatre. At Armutlu are a few rock-tombs, also a platform, probably of a temple; and in the neighbouring burying-grounds are many fragments of temples, probably carried from this spot.

After leaving Armutlu we continued along the E. side of the plain towards Almalí, passing several villages. We crossed a small stream flowing to the N.E., which is said to fall into the Avelan Gol: near the town we crossed a larger stream by a bridge. The latter appears to have its source in an extensive marsh on the W. side of the plain, and falls into a cave about one mile S.E. of the bridge.

Almalí is said to be the largest town in this part of Asia Minor. It stands at the N.E. end of the plain, in a little valley or natural amphitheatre of the mountains: it is surrounded by gardens, and well supplied with water. The houses are built of unburnt bricks, and roofed with thin deals: it contains about 1500 houses, has several mosques, a bazaar, and a market on Thursdays. Many Frank merchants resort here; their purchases are generally sent to Mákri for exportation. The people of these plains appear to be in better circumstances than those near the coasts; their houses are more neat and comfortable, and they dress better; the fences, roads, and bridges are in better order; and the general aspect of the country gives the impression of being in the hands of an industrious people who have a stake in its welfare. There are no traces of antiquity at Almalí. We inquired for Eski Hissar, and were told there were no ruins there. While at Almalí the weather continued unfavourable for fixing the town with the accuracy we usually practise, but I may venture to hope that I have placed it very nearly in its true position.

Wednesday, October 27th.—Left Almalí, recrossed the bridge, and, travelling along the borders of an extensive marsh, arrived at the village of Kiziljar, situated at the foot of the Massicytus mountains. On an eminence above this village are a few tombs and other traces of antiquity. We continued our journey, and passed the night at the village of Yuvalí, at the western extreme of the plain. Here we were accommodated with a very comfortable room—a luxury after the dirty khan at Almalí, or our tent,

which is a poor shelter in this wet season. There are many pretty gardens surrounding this village, in which the inhabitants reside in the summer.

On leaving Yuvalí we ascended a steep hill, which bounds the plain on this side, and, in 2½ hours, arrived at some ruins which we had been directed to. There are many tombs scattered about: the lids of some are ornamented with bas-reliefs. In a burying-ground near are fragments of columns and pedestals, and for a considerable distance around are scattered massive blocks of hewn stones, foundations and fragments of temples. We copied two inscriptions on sarcophagi (Nos. 3 and 4), which, although very imperfect, it is hoped will throw some light on the history of the place. Travelling in a N.W. direction, over a mountainous country, for an hour and a half, we descended into another series of elevated plains, and at night reached the village of Sedeler Yailah; this name is applied to it to distinguish it from the Sedeler of the Xanthus valley: there is also a Duvah Yailah, and a place was pointed out to us as belonging to the Tàlamàn Yailah. Every important place in the low countries appears to have its Yailah, or highland district, where the inhabitants repair to escape the heats of summer. When the autumnal rains set in they retire to their winter quarters in the valleys: the Greeks of Levisey, who are nearly all shoemakers, leaving their wives and families at home, follow the Turks in their migrations to the highlands; in the winter a number of them open stalls at Mákri.

Sedeler Yailah stands at the east end of an extensive plain; it is prettily situated, surrounded by gardens and vineyards. There are many vestiges of antiquity here, such as pedestals, fragments of columns, and massive foundations. A Turk called us into a house to show us a mosaic pavement. This house was offered to us for our night's lodging, but, being the place in which the Turks assemble in this season (the Ramazan) to pray, and eat their evening meal, we declined, fearing we should inconvenience them, or interfere in some way with their observances. This apprehension caused us to spend many uncomfortable nights in our tent, for the strangers' house appeared invariably to be the house of meeting for the villagers.

On leaving Sedeler Yailah we skirted the south side of the plain, passing near Duvah Yailah, and thence to Karacham, where we found the ruins of a city—the Turks call the ruins Urlujah. The principal remains are on a hill which projects a short distance into the plain: there are a few tombs and foundations on the plain. On ascending we found many sarcophagi, and on the summit of the ridge are some fine ruins of temples and other large buildings, which have been highly ornamented:

among these we found some inscriptions. The covers of the sarcophagi are generally ornamented with the figure of a lion. To the S.W. of this are some fine remains of the city wall, having inscriptions on each side the gateways, but too much obliterated to be copied; a little below the wall, among a mass of other ruins, are remains of an aqueduct; the water was conveyed through hollow stones, similar to those at Kalamaki. From the summit of the hill we had a fine view of the plain, and the stream which flows through it, a tributary of the Xanthus—perhaps the Adesa, in which case this city may be Choma. We found no theatre.

From Urlujah, crossing the stream by a stone bridge, we directed our course towards Tremelí, near which, we were told, there were ruins. On an eminence on the right bank of the river are the ruins of a temple, of white marble. About ½ a mile beyond it is another site: Mr. Fellowes appears to have passed this spot on his route from Almalí to Orahn, but he did not observe the ruins on the hill.

Continuing our route on different courses we arrived, in 6 hours, at the ruins we were in search of, called by the Turks Katra. On approaching we passed a row of sarcophagi, each ornamented with a lion on its cover. The principal part of the city appears to have been built on the low hill, which is a series of platforms, covered with masses of ruins; here are the remains of several temples, which appear to have been highly decorated; also a great many inscriptions, generally well preserved—we copied a few. It would be necessary to be provided with materials for clearing away the rubbish, and turning some of them over: they are generally on pedestals. On the summit of the hill above the ruins we observed a hollow circular stone, with a cross on the concave side; a small building near it has perhaps been a Christian church. The upper part of this hill is enclosed by a wall of the middle ages, built of materials from the ancient city. The theatre, on the western side of this hill, is in good preservation; it is plainly built; the middle seats have not been completed: bold rocks protrude much beyond the line of the upper row; it has probably been purposely left so to give scenic effect: it faces the west, and commands a magnificent view of the mountains in front of it. The lower theatre has been built in a natural hollow in the mountain, which has the effect of making it appear of much larger dimensions than it really is; nearly all the seats have been removed; the platform and proscenium have been raised on arches. This theatre is 150 feet in diameter; the upper one, 120. We did not see any rock-tombs either here or at Urlujah; a few sarcophagi are hewn out of the solid rock.

From the ruins we proceeded in a northerly direction, for an

hour and a half, to Tremelí: here we received information of extensive ruins at a place called Huzum, 3 miles N.E. of Tremelí. Unfortunately, we had not time to visit them, but were obliged by other duties to return to the coast. Tremelí is situated at the base of the hills on the S.E. side of an extensive plain; it is said to contain 500 houses, and is surrounded by gardens and vineyards: a stream rises near it, which joins the Tàlamàn river. From Tremelí we proceeded to the village of Pejik, where we passed the night, and on the following morning set out on our return to Mákri. At the distance of one mile from Pejik we entered the mountains through a narrow defile, which pours out a small stream, also a tributary of the Tàlamàn Chai (ancient Indus). These are probably the mountains of Cibyra, where the Indus is said to have its rise. The ruins at Katra and Huzum may probably be those of the cities Bubon, Balbura, or Œnoanda: Cibyra must be looked for more to the N. We continued gradually to ascend through a narrow valley by the banks of a mountain-stream. Passing through a fresh-water tertiary deposit, we arrived at the summit of the pass about noon: at this point we could not be less than 6000 feet above the sea. The road is in good condition; it would soon become impracticable, if not attended to. There are many khans erected for the convenience of travellers; but we did not pass near a single village. After half an hour's rest we continued our descent: towards the end of the pass the mountains are broken into huge precipices and deep ravines, presenting some fine points of scenery. At the end of eight hours' travelling we arrived, amidst heavy rain, at the village of Dereh Kevi: the strangers' house was already occupied, but an hospitable Mussulman sheltered us in his workshop, who endeavoured to compensate, by his attentions to us, for the indifference of our lodgings. Above the village, on the summit of a precipitous hill, are some ruins named Assar; we did not visit them.

Tuesday, November 2nd.—Continued our journey, and, passing through Huzumli, arrived at Mákri at sunset.

After our return to the Isabella we were employed sounding; in calms we dredged, which gave Mr. Forbes employment for his pencil and microscope. In the end of December, while at Rhodes, on our return voyage to the Beacon, we unexpectedly heard of her having arrived in the neighbourhood for the purpose of removing the Xanthian marbles. We rejoined her at Mákri on the 29th December, 1841.

IV.

While the Beacon lay at Mákri I had many opportunities of making additions to the map of the valley of the Xanthus; on

these occasions I had the valuable assistance of the Rev. E. T. Daniell, whose knowledge of ancient literature enabled him to decide, from an inscription found at Orahn, that it is the site of Araxa, and not of Massicytus, as was erroneously supposed.

Nearly two miles N. of Orahn, at the foot of an immense precipice, called Masta-tagh, the Xanthus is seen issuing from the ground, and immediately becomes a considerable stream: it is joined at the same spot by its tributary from the Yailah, which rushes down through a tremendous chasm in the mountains. In the dry season this stream is very insignificant; at the time of our visit it yielded as much water as the springs which we have named the source of the Xanthus—they are so called by the natives, who say their waters never diminish. The Xanthus receives its colouring matter from the large tertiary beds through which it flows.

The ancient wall discovered on the left bank of the Xanthus, N. of the city, may probably have been a boundary between two nations.

Hearing there were ruins on the Nif Yailah, I made a tour in that direction, but found nothing of importance; they consist of a few ancient walls and some sarcophagi. The snow lay deep on the mountains, and was imprinted with the footmarks of numbers of leopards and jackals.

In our intercourse with the natives on these little excursions we have uniformly found them civil and obliging. To strangers of their own nation the fullest hospitality is shown, but from us an acknowledgment was always expected.

INSCRIPTIONS COPIED IN CARIA AND LYCIA IN 1840-1, BY MESSRS. FORBES AND HOSKYN.

No. 1, at Caunus.

ΓΑΙΟΝΚΑΣΣΙΟΝΣΑΛΑΜΑΜΑΝΕΠΙΤΡΟ
ΠΩΝΑΥΤΩΚΡΑΤΟΡΟΣΝΕΡΟΥΑΤΡΑΙΑΝΟΥ
ΚΑΙΣΑΡΟΣΣΕΒΑΣΤΟΥΓΕΡΜΑΝΙΚΟΥΛΥΘΙΑΣΤΑΙ
ΙΙΑΜ : : : Τ : ΣΡΑ : : ΑΛΑΤΙΑΣ : : ΒΟΥΛΗΚΑΙΟΔΗ
: ΟΣΟ : ΑΥΝΙΩΝΙ : ΑΙΗΓΕΡΟΥΣΙΑ

No. 2, at ruins in Gulf of Scopea, probably Crya.
On a rock tomb.

ΘΟΩΟΝVΜ^Θ///
ΛΨΘΩΟ^ VΓFΘ
·ΜΓΝΨΟΘΔΨΘF
ΨΟFΘΔΑΝΜ

No. 3, at ruins near Yuvali, on route to Sedeler Yailahsi.
On a sarcophagus.

ΟΙΟΛ ΔΤΑΡ
ΓΑΝΔΑΚΕΩΔ
CΑΡΤΕΜΩΝΤΙΝ
ΔΓΑΝΥΙΩΤΟΥΜΟΛΗ
ΙΟΤΤΛΑΟΥΑΝ : : ΑΟΔΙ
ΙΗΝC ΕΝΕΚΕΝ
Υ ΛΡΟΥΟ Η
ΔΕΥΟΕ ΟΠΟΝΕΤΕΡ

No. 4, at same place. On a sarcophagus.

ΟΠΟΛΕΝΩΛΚΑΚΑΙ
Ι : : ΛΟΠΙΑΣΑΡΚ : : ΕΠΑΣΤ
Γ : : ΑΝΩΣΤΙΝΑΣΔΕΙΑΙΕΚ
ΣΣΟΥΚΑΤΕΣΚΕΥΑΣΕΝ
ΠΝΔΩΜΑΤΟΘΗΚΗΝΕΑΥΤΩ
ΕΑΝΔΕΠΣΕΠΕΕΝΕΝΚΗΠΤΩΜΑ
ΑΛΛΟΕΚΤΕΙΣΕΠΩΟ : : : : ΟΑΝ
ΔΕΩΝΔΡΜΩΧΛΕΤΩΝΟ
ΕΔΕΝΔΑΣ : : ΝΕΚΔΠΙΙΣ : ΣΑΗ

No. 5, on a pedestal near Sedeler Yailahsi.

ΑΡΤΕΜΟΤΙΑΜΕΡΛΑΤΟΥ
ΚΑΙΓΗΜ ΜΟΟΥ
ΟΡΕΣΤ : : ΟΥΙΟΣ
ΤΟΥΣΓΟΝΕΙΣΛΥΤΟΥ
ΜΝΗΜΗΣΕΝΕ Ν
ΤΩΑΡ Ρ : Κ

No. 6, at ruins at Urlujah. On a pedestal.

ΑΕΩΝΟΘΕΤΟΥΝΤΟΣΙΩΥ
ΝΟΥΛΟΥΚΙΟΥ ΑΙΟΥΕ
ΑΡΕΣΤΟΥΠΑΝΜΤΥΡΕΩΣ
Ε : : : : : : : : : : ΕΥΑΓΕΣΤ
ΩΝΗΣΑΥΤΟΣΣΥΝΕΣΤΕΣΑ
ΤΟΕΞΟΙΚΙΩΝΧΤΗ ΑΤΩΝ
ΠΟΠΛΙΟΣΣΘΕΝΙΟΣΦΡΟΝ
ΤΩΝΟΙΝΟΑΝΔΕΥΣΥΙΟΣ : : :
ΠΛΙΟΥΣΘΕΝΙΟΥΛΙΚΙΝΝΙΑ
ΗοΥΣΤΕΦΘΕΙΣΑΝΔΡΩΝ

ΠΑΝΚΡΑΤΙΟΝ//ΟΙΝΟΝ
ΛΥΚΙΩΝ
ΠΑΙΔΩΝΜΕΝΤΚΤΡΩΤΑΠΑΛΙΝ
ΕΣΤΕΨΕΜΕΠΑΤΡΗ
ΚΑΙΚΥΔΗΝΕΚΛΥΤΗΕΙΚΟΝΙΧΑΛ
ΚΕΛΑΤΩ
ΠΑΝΚΡΑΤΙΟΝΔΑΝΔΡΩΝΚΟΙΝΟΝ
ΛΥΚΙΩΝΜΕΤΕΠΕΙΤΑ
ΑΟΑΜΕΜΟΣΠΑΤΡΗΘΗΚ:ΕΡΑΤΟΝ
ΞΟΑΝΟΝ

No. 7, at ruins at Katra, near Tremilí. On a pedestal.

ΕΠΙΑΓΩΝΘΘΕΤΟΥ
ΠΡΩΤΘΥΔΙΑΒΙΟΥΘΟ
ΑΝΤΙΑΝΟΥΔΙCΜΕΙ
ΛΕΑΓΡΟΥΚΑCΤΟ
ΡΟCΘΕΜΙΔΟCΑΤΟ
ΜΕΝΗCΕΚΔΩΡ//
ΑCΜΕLΕΑΓΡΟΥΚΑC
ΤΟΡΟΕΤΟΥΤΑΙ
ΠΟΥΑ//ΤΟΥ
ΘΟΑCΕΡΜΑΙΟΥΘΟ
ΑΝΤΟCΤΡΙCΤΑΣΕ
ΩCΤΗCΠΡΩΤΕΥ
ΟΥCΗCΝΕΙΙΚΗΕΑC
ΑΝΔΡΩΝΠΑΝΚΡΑ
ΤΙΟΝΡΡΩΤΟC

No. 8, at same place. On a pedestal.

ΕΠΙΑΓΩΝΟΘΕΤΟΥ
ΠΡΩΤΟΥΔΙΑΒΙΟΥ
ΘΟΑΝΤΙΑΝΟΥΔΙC
ΜΕΛΕΑΤΡΟΥΚΑCΤΟ Υ
ΡΟCΘΕΜΙΔΟCΑΧΘΕΙ Μ
//CΗCΚΑΙΤΗC.C.ΕΚΔΘ C
ΡΕΑCΜΕΛΕΑΤΡΟΥ. Ρ
ΚΑCΤΟΡΟCΤΟΥΠΑΠ
ΠΟΥΑΥΤΟΥ
ΜΟΥCΑΙΟCΤΡΙCΤΡΩ
ΙΛΟΥΜΟΥCΑΙΟΥΤΙΟ
ΛΥΔΕΥΚΟΥCΟΚΑΙΚΑ
ΛΑΝΔΙΩΝΑΝΗΡΕΚΤΩΝ
ΤΡΩΤΩΝΕΝΤΗΠΟ

No. 9, at same place. On a pedestal.

ΑΥΡΙ· ΙΤΡΩΙΛΟΥΔΙϹ
ΕΠΙΑΤΩΝΟΘΕΤΟ
ΠΡΩΤΟΥΔΙΑΒΙΟΥ
ΑΥΡΘΟΑΝΤΙΑΝΟΥ
ΥΙΟΥΘΟΑΝΤΙΑΝΟΥ
ΜΕΛΕΑΤΡΟΥΚΑϹΤ
ΡΟϹΘΕΜΙΔΟϹΑΧΘΕ
ΕΗϹΚΑΙΤΗϹΑΙΕΚΔ
ΡΕΑϹΜΕΛΕΑΓΡΟΥ
ΚΑϹΤΟΡΟϹΤΟΥ
ΠΑΠΠΟΥΑΥΤΟΥ
ΛΥΡ ΤΡΩΙΛΟϹΔΙΕ
ΒΑΒΟΥΡΕΥϹΝΕΙ
ΚΗϹΑϹΠΑΙΔΩΝ
ΠΑΝΚΡΑΤΙΟΝ

No. 10, at same place.

...ΝΑ
ΙΕΡΗΙΗΝ
ΜΕΓΙΣΤΟ
ΣΕΒΑΣΤΟΝ

No. 11, at same place. On a pedestal.

ΕΠΙΑΤΩΝΟΘΕΤΟ
ΠΡΩΤΟΥΔΙΑΒΙΟΥ
ΘΟΑΝΤΙΑΝΟΥΔ·Ι·Ϲ
ΜΕLΕΑΓΡΟΥΚΑϹΤΟ
ΡΟϹΘΕΜΙΔΟϹΑΟΕΝ
ϹΗϹΚΑΙΤΗϹΖΕΚΔΩ
ΙΕΑΓΜΕΛΕΑΓΡΟΥΚΑ
ΤΟΡΟϹΤΟΥΠΑΠ
ΡΟΥΑΥΤΟΥ
ΠΡΟΚΛΙΑΝΟΠ : ΙΝΛΙ
ΟΥΑΡΤΔΡΜΩΝΟϹ..ΕΙ
ΜΑΙΟΥΑΡΤΕΔΩ
ΝΟϹΚΑϹΤ
ΜΟΥϹΑΙΟϹΤ...
ΜΟΥϹΑΙΟΥΑΓΟΝΙϹΑ
ΜΕΝΘΙϹΝΔΟΖΩΙΚΑ..
ϹΥϹΤΕΦΘϹΝΤΞϹΠ..
ΔΩΝΠΑΛΙΝ...

II.—*Remarks on* Mr. Hoskyn's *Paper.* By Colonel William Martin Leake, F.R.S.

Mr. Hoskyn's paper is important to the ancient geography of Asia Minor, as are all the communications of Captain Graves and his officers, and it is well worthy of a place in our Journal. It will, perhaps, be expected that I should offer some remarks on the ancient names in Mr. Hoskyn's map.

To begin from the W. The inscription, No. 1, leaves no question as to the identity of Caunus;* and Mr. Hoskyn would have been justified, also, in attaching to the great harbour of Karagach the name *Panormus of the Caunii*, for, although the Stadiasmus is not very intelligible in this place, the name alone is sufficiently descriptive of the magnitude of that harbour, and of its proximity to Caunus. Pisilis can only be considered as rightly placed by Mr. Hoskyn on the presumption that the Tàlamàn-su was the Calbis of Strabo,† which it seems to be; as it is not likely that, omitting all notice of such a river as the Tàlamàn-su, he should have named the stream of Koi-gez, which is little more than the discharge of a lake, the river of Caunus. At the same time, there can be no doubt that the Tàlamàn was anciently named Indus, no other river in this part of the country being suited to Pliny's description of the Indus as rising in the mountains near Cibyra, and as receiving many tributaries in its long course.‡ Probably, therefore, the Indus and the Calbis were one and the same river. Ptolemy and Mela, as well as Strabo, mention none but the Calbis in this quarter.§ Livy and Pliny the Indus alone.|| That the Indus had a second and earlier appellation we may infer from the accidental origin of the name Indus.¶ But perhaps we may rather regard that story as one of the fables which the Latin historian delighted in repeating, and, as we do not find the name Indus in any Greek author, we may be allowed perhaps to conjecture that the true local name

* Inscriptions copied in Caria and Lycia in 1840-1, by Messrs. Forbes and Hoskyn:—

No. 1, at the ruins near the bay of Koi-gez.

Γάϊον Κάσσιον Σαλαμαλλὰν, ἐπίτροπον Ἀυτοκράτορος Νέρουα Τραϊανοῦ Καίσαρος Σεϐαστοῦ Γερμανικοῦ, Λυκίας καὶ Παμφυλίας καὶ Γαλατίας, ἡ ϐουλὴ καὶ ὁ δῆμος ὁ Καυνίων καὶ ἡ γερουσία·

† Page 651.

‡ H. N. 5, 28.

§ Ptolem. 5, 2; Mel. 1, 16; Strabo, ubi sup.

|| Liv. 38, 14; Plin. H. N. ubi sup.

¶ "Flumini Indo ventum est: cui fecerat nomen Indus, ab elephanto projectus." (Liv. ubi sup.)

was Sindus, and had a common origin with that of the town Sinda, which stood at its source, a little to the northward of Cibyra.* Calbis, in like manner, may have been nothing more than Cabalis with a slight metathesis, for Sinda was in Cabalis, or very near it.

As there can be little doubt that the lower part of the valley of the Tàlamàn-su formed the best part of the territory of Calynda, one is surprised at Mr. Hoskyn's want of success in gaining any information as to the position of that city. Possibly the remains may be inconsiderable, and situated further from the coast than Mr. Hoskyn's researches extended, as indicated by his map; for we may be allowed to add something considerable to the 60 stades of Strabo for the retreat of the sea, as we find almost invariably necessary in similar cases on alluvial shores at the mouth of great rivers. Pisilis, and the place of which there are ruins at the eastern angle of the bay of Tàlamàn, appear to have been two maritime dependencies of Calynda; and of those two places, the latter is not improbably the Chydæ, or Clydæ, which Ptolemy and the Stadiasmus agree in placing not far to the westward of Crya. Of Crya, written Cryassus by Plutarch and Stephanus, confirmed by an extant inscription,† as well as of Dædala, there can be little or no doubt that Mr. Hoskyn is right in his location, the islands opposite to those places having been noticed by Pliny and Stephanus. Three of them belonged to Cryassus, and two to Dædala. The Cochlia (Κόχλια) of the Stadiasmus answers to the isthmus of Cape Suvelah (the ancient Artemisium), and may possibly be the same as the Κοχλιοῦσα (a place of shells), which Stephanus describes as an island of Lycia.‡

Of Cadyanda, Pinara, Sidyma, and Tlos, which were visited by Mr. Hoskyn, without knowing that Mr. Fellows had already ascertained those sites, little remains to be said, unless some new inscriptions should have been discovered.

Having already had occasion to offer some remarks on the ancient positions of the western coast, as surveyed by Captain Beaufort, I have no further observation to make on Cydna, otherwise Pydna, or on the eight capes of Cragus, now called the Seven Capes, or on Cape Hiera, or on Cissides.§ But identifying Cape Hiera with the most northern, which is also the most western of the Seven Capes, we may remark that the distances in the Stadiasmus will place *Calabantia* at Sanjakli, and the *Perdicia* of the same document, a place named also by Stephanus, at a creek 5 or 6 miles to the northward of Sanjakli. Perdicia, by its position, appears to have been a port dependant on Pinara. Mr. Hoskyn

* On the relative situations of Cibyra and Sinda, see Journal of a Tour in Asia Minor, p. 152; Strabo, p. 631.

† Journal of a Tour in Asia Minor, p. 224.

‡ Ibid.

§ Ibid., p. 181.

has attached the name of Anticragus to the mountains which rise to the southward of Pinara, and has confined Cragus to those on which Sidyma is situated. Strabo, however, describes Pinara as situated under Cragus, not Anticragus, and the latter as situated near Telmissus. We may conclude, therefore, that the ancients comprehended under the name Cragus all the ridges as far northward as Mendós inclusive, which is the highest summit of all this range; and that Anticragus was confined to the mountains which extend from thence to Telmissus, and the highest point of which is 3 miles to the N.E. of Mendós, and, according to Mr. Hoskyn, not more than 400 feet lower than that mountain. Such being the position of Anticragus, Carmylessus, which Strabo places in a φάϱαγξ or retired valley of Anticragus, seems to have comprehended the vale of Ovajik, and Simbolú may have been its harbour. It is remarkable that no remains have been found on Mount Cragus of a city of that name, which, although not one of the six leading cities of Lycia, which had each three votes in the general council, was at least of the second class, as its autonomous silver coins are still extant. Possibly Cragus was the same place as Sidyma. The latest coins of Cragus are of the time of Augustus; there are no coins of Sidyma. Pliny is the earliest author who names Sidyma; its inscriptions are all of the second century of our era, and the other authorities in which the name occurs are all of the same or a still later age, namely, Ptolemy, the Notitiæ, and the acts of the councils. We know that many places in Lycia had two names, and that the people were δίγλωττοι.

Strabo affirms that the people of Cragus and Anticragus applied to those mountains the fable of the Chimæra, and in proof of it adduced the name Chimæra attached to a ravine of Mount Cragus opening to the sea. But we may be allowed to suspect, that by a practice which was not uncommon among the Greeks of Roman times, the name Chimæra had been attached to the place at some comparatively late period, for the purpose of supporting an unfounded pretension, for there are ample reasons for applying that μῦθος to the eastern mountains of Lycia. We know that the Greeks who first colonised Lycia settled in the valley of the Sibrus or Xanthus, subduing the ancient inhabitants, the Solymi, who spoke a language resembling the Phœnician, or driving them into the eastern parts of the Lycian peninsula. The two divisions of this country are so strongly separated by Massicytus and the other mountains which rise from the eastern side of the Xanthian valley, that it was not until about two generations before the Trojan war that the Greek colonists subdued the whole peninsula. The recesses of Mount Solymi were the last to resist. Here Bellerophon, who lost a son in the war, particularly distinguished

himself, and was at last successful.* The comparative recency of the event, when Homer wrote, leaves no doubt that there is a foundation of truth in the actions of Bellerophon, though an admixture of fable was natural also in times when poetical tradition was the only history. The mountains of the Solymi were said to have been defended by the Chimæra, a triple-headed monster, breathing fire, resembling a lion in the anterior part of her body, a goat in the middle, and a serpent behind.

Πρόσθε λέων, ὄπιθεν δὲ δράκων, μέσση δὲ χίμαιρα,
Δεινὸν ἀποπνείουσα πυρὸς μένος αἰθομένοιο·
Hom. Il., Z. 181.

Ἡ δὲ χίμαιραν ἔτικτε, πνέουσαν ἀμαιμάκετον πῦρ·
Τῆς δ' ἦν τρεῖς κεφαλαί· μία μὲν χαροποῖο λέοντος,
Ἡ δὲ χιμαίρης, ἡ δ' ὄφιος, κρατεροῖο δράκοντος·
Hesiod, Theogon., v. 319.

And thus exactly is she represented in numerous works of Grecian art, particularly in some of its most ancient specimens, the paintings on ceramic vases, in some of which fire is represented as issuing from all the heads.

Servius, in explaining the words of Virgil, "flammisque armata Chimæra," gives a rational meaning to the fable by his remark that Chimæra was a mountain in Lycia, which had a natural fire at its summit, consisted of pastures abounding with goats in the middle, and was infested by serpents in the lower parts; he adds, that the same mountain was frequented by lions. The place where the natural fire issued from the earth was named Hephæstium, as sacred to Vulcan, and was situated in a mountain near Phaselis. Nothing more, therefore, was required than the discovery, by Captain Beaufort, of Phaselis, of its mountain, and the natural fire upon it, all exactly as described by Ctesias, Scylax, Pliny, and Seneca,† to give an historical explanation of the fable, and to prove its erroneous application by the Western Lycians.

The ruins at Orahn are shown, by means of an inscription

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* After the loss of Lycia, the Solymi retained possession of Milyas for many centuries, and appear to have extended over a part of the country which was afterwards included in Pisidia; for the poet Chœrilus (ap Euseb. Præp. Evang. 9, 9) alludes to their having dwelt, at the time of the expedition of Xerxes, on the shores of a great lake, with which that of Egerdir seems best to correspond.

Τῶν δ' ὄπιθεν διέβαινε γένος θαυμαστὸν ἰδέσθαι
Γλῶσσαν μὲν φοίνισσαν ἀπὸ στομάτων ἀφιέντες,
Ὤκουν δ' ἐν Σολύμοις ὄρεσι, πλατέῃ παρὰ λίμνῃ,
Αυχμαλέοι κεφαλὰς, τροχοκουράδες αὐτὰρ ὕπερθεν,
Ἵππων δαρτὰ πρόσωπ' ἐφόρουν ἐσκληκότα καπνῷ.

Compare Herodotus 6, 77.

† Ctesias ap Phot. cod. 72; Scylax, p. 39; Plin. H. N. 2, 106; Seneca, ep. 79.

copied by the late Rev. T. D. Daniell, to have been those of Araxa, and not of Massicytus, as Mr. Fellows supposed. Massicytus may possibly have been the town of which Mr. Hoskyn found ruins, not far beyond Kungelar, on his way to Almalí; for, although they seem scarcely adequate to those of a city which coined its own money, the position on the extremity of Mount Massicytus favours the supposition, as well as its importance as commanding the principal pass leading from the valley of the Xanthus into the eastern portion of Lycia.

It is in the country into which this pass led Mr. Hoskyn that his materials of ancient geography are most new and valuable. The inscriptions which he there copied show that the districts of Almalí and Tremilí formed a large portion of the Tetrapolis of Cibyra, a confederacy which, under its monarchs, comprehended all the country between Pisidia and Peræa of the Rhodii, and could bring 30,000 infantry and 2000 cavalry into the field; but was at length conquered by the Romans under Muræna, when Bubon and Balbura, two of the four cities, were separated from Cibyratis and annexed to the Lycian community.* The fourth city of the Tetrapolis was Œnoanda, which name we find in inscriptions Nos. 4 and 6. No. 4 is a fragment containing part of a common formulary on sepulchral monuments, by which the violator of the tomb was rendered liable to a specified fine, payable to the people or to the treasury of the city, which in this instance is distinctly stated to have been that of the ΟΙΝΟΑΝΔΕΙΣ.† No. 6 is on a monument which had been erected in commemoration of his agonistic victory by Publius Sthenius Fronto, a man of Œnoanda (Οἰνοανδεύς), at the expense of his family, but by order of his native city.‡ The tenor of both these inscriptions is such

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* Journal of a Tour in Asia Minor, p. 147.

† Inscriptions copied in Caria and Lycia, in 1840-1, by Messrs. Forbes and Hoskyn:—

No. 4, at the ruins between Yuvalí and Sedeler Yailahsi.

. . . .
. . . .
. . . . κατεσκεύασεν
τὴν σωματοθήκην ἑαυτῷ·
ἐὰν δέ τις ἐπενέγκῃ σῶμα
ἄλλο, ἐκτίσει τῷ Οἰνοαν-
-δέων δήμῳ δηνάρια ϙ, ἐξ ὧν ὁ
ἐλέγξας (λήψεται . . . .

‡ Inscriptions copied in Caria and Lycia in 1840-1, by Messrs. Forbes and Hoskyn:—

No. 6, at the ruins called Urlujah.

Ἀγωνοθετοῦντος Ἰουνίου Λουκίου (Ἑρ)μαίου Εὐαρέστου Πυλαιτυρέως, Ε . . . . Ἐυαρέστ(ου) ὀνήσαντος, συνεστήσατο ἐξ οἰκίων χρημάτων

as to leave no reason to doubt that the gentile adjective gives the name of the ancient site. The places, nevertheless, where they were found are distant 10 or 12 miles from each other. The only explanation which can be given of this difficulty is, that the *tomb* was in a subordinate *κώμη* or town of the *Œnoandic* territory, and that the *ruins* at Urlujah are those of *Œnoanda* itself, as well because it cannot be supposed that statues or other memorials of victorious athletæ were placed anywhere but in the native cities of the victors, as because it was at Urlujah that Mr. Hoskyn found those proofs of a large city which were wanting at the other site between Yuvali and Sedelér Yailah. On the other hand, supposing the latter site to have been that of a dependency of Œnoanda, nothing is more likely than that the fine for the violation of a sepulchre at that place should have been payable to the treasury of the city on which it depended. In Mr. Fellows's 'Discoveries in Lycia,' p. 142, a sepulchral inscription is given which renders the violator of the tomb liable to a fine payable to the city of Xanthus, though the monument was found at the ruins of Cydna, distant 5 or 6 miles from, and doubtless a maritime dependency of, Xanthus.*

Inscription No. 9, found at Katra, where are ruins of five temples, two theatres, and many other buildings, is on the base of the statue of a young athlete of Babura, or Balbura, named Aurelius Troilus, son of Aurelius Troilus.† Hence it appears that these are the ruins of Balbura. An objection to this conclusion may perhaps be made, that, as three other inscriptions of the same tenor (Nos. 7, 8, 11), found at Katra, do not mention the local

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Πόπλιος Σθένιος Φρόντων, Οἰνοανδεὺς, υἱὸς Ποπλίου Σθενίου Λικιννιανοῦ, στεφθεὶς ἀνδρῶν παγκράτιον κοινὸν Λυκίων.

Παίδων μὲν τὰ πρῶτα πάλιν ἔστεψέ με πάτρη
Καὶ κυδῆνε κλυτῇ εἰκόνι χαλκελάτῳ·
Παγκράτιον δ' ἀνδρῶν κοινὸν Λυκίων μετέπειτα
'Αράμενος, πάτρῃ θῆκ' ἐρατὸν ξόανον.

The agonotheta Euarestus was a native of Tyre in Phœnicia, at that time called Παλαίτυρος.

* Of this place the entire circuit of the ruined walls is extant, and at the lowest angle the remains of a building, which an inscription found in it—Ποσειδῶνι εὐχὴ Μαυσώλου 'Αλαβάρχου—shows to have been a temple of Neptune.

† Inscriptions copied in Caria and Lycia in 1840-1, by Messrs. Forbes and Hoskyn:—

No. 9, at Katra.

Αὐρ(ηλίου) Τρωΐλου δίς.

'Επὶ ἀγωνοθέτου πρώτου διὰ βιόυ Αὐρ(ηλίου) Θοαντιανοῦ υἱοῦ Θοαντιανοῦ, Μελεάγρου Κάστορος, θέμιδος ἀχθείσης καὶ τῆς ια, ἐκ δωρέας Μελεάγρου Κάστορος τοῦ πάππου αὐτοῦ, Αὐρ(ήλιος) Τρώϊλος δίς, Βα(λ ?)βουρεύς, νεικήσας παίδων παγκράτιον.

origin of the person erecting or honoured by the monument,* the insertion of that of Troilus argues him to have been a foreigner. But on observing the recurrence of the name Troilus in two of the other inscriptions, and that on one of these the grandson of a Troilus was one of the *πρῶτοι* of the city which stood at Katra, we cannot but conclude that Troilus was one of the noble names of that place,† and that the ruins are those of Balbura.

The local connexion of all these names is shown also by the fact that all the four monuments were raised under the same agonotheta Thoantianus, and that the expense was borne, or, in other words, the pecuniary prize was furnished, by Meleager, son of Castor, grandfather of the agonotheta. Upon the whole, we are authorised in deducing, from the inscriptions copied by Messrs. Forbes and Hoskyn, that the districts of Œnoanda and Balbura, two of the Cibyratic cities, extended from near Almalí to Tremilí. If the plains around Almalí were a part of the Cibyratis, we may presume that they constituted the Bubonia, though there is also a possibility that the ruins at Huzum, 3 miles N.E. of Tremilí, described to Mr. Hoskyn as "extensive," may be those of *Bubon*, in which case the ancient site observed by Mr. Fellows at Eskí

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* Inscriptions copied in Caria and Lycia in 1840-1, by Messrs. Forbes and Hoskyn:—

No. 7, at Katra.

Ἐπὶ ἀγωνοθέτου πρώτου διὰ βιόυ Θοαντιανοῦ δὶς Μελεάγρου Κάστορος, θέμιδος ἀγομένης ἐκ δωρέας Μελεάγρου Κάστορος τοῦ πάππου αὐτοῦ, Θόας, Ἑρμαίου, Θόαντος, τρὶς Τάσεως τῆς πρωτευούσης, νεικήσας ἀνδρῶν παγκράτιων πρῶτος.

No. 8, at the same place.

Ἐπὶ ἀγωνοθέτου πρώτου διὰ βίου Θοαντιανοῦ δὶς Μελεάγρου Κάστορος θέμιδος ἀχθείσης καὶ τῆς σ (?) ἐκ δωρέας Μελεάγρου Κάστορος, τοῦ πάππου αὐτοῦ, Μουσαῖος τρὶς Τρωΐλου Μουσαίου Πολυδεύκους, ὁ καὶ Καλανδίων, ἀνὴρ ἐκ τῶν πρώτων ἐν τῇ πό(λει).

No. 11, at the same place.

Ἐπὶ ἀγωνοθέτου πρώτου διὰ βίου Θοαντιανοῦ δὶς Μελεάγρου Κάστορος, θέμιδος ἀχθείσης καὶ τῆς ζ′ ἐκ δωρέας Μελεάγρου Κάστορος, τοῦ πάππου αὐτοῦ, Προκλιανὸν (Ἑρμ)αίου, Ἀρτέμωνος, Ἑρμαίου, Ἀρτέμωνος, Κάστ(ορος), Μουσαῖος Τρωΐλου, Μουσαίου, ἀγωνισάμενον ἐνδόξως καὶ ευστεφθέντα παίδων πάλην.

Θέμις was the celebration of a *θεμάτικος ἀγὼν*, or contest, in which the prize was a *θέμα*, or *stake* of money, thus distinguishing this kind of contest from the *στεφανίτης ἀγών*, in which the prize was a crown. The themides were numbered. A coin of Aspendus is inscribed *θέμιδος έ*. In an inscription of Telmissus are the words *νεικήσας παγκράτιον τὴν τετάρτην θέμιδα*—in an inscription of Xanthus *ἀγωνισάμενον ἀνδ*[illegible]*ν πάλην ἐν τῷ ἐπιτελεσθέντι ἀγῶνι θέμιδος γ̃, ἀγωνο θετοῦντος τῆς θέμιδος διὰ βίου*, &c. In considering the low numbers in these examples, we may doubt the correctness of *σ* (300) in inscription No. 8.

† In the inscriptions of Aphrodisias are found remarkable instances of the local prevalence of particular names in this part of Asia Minor.

Hissar, near Almalí, may be that of the Alymala of Stephanus,* of which Almalí seems to be a corruption. As to Cibyra itself, there is great reason to believe, with Mr. Hoskyn, that it must be sought for considerably to the northward of Tremilí.†

Mr. Fellows, who followed an interesting route from near Œnoanda to Denizlí, near Laodiceia on the Lycus, in which he crossed the track of Corancez, and fell into that of Rawson at Karaeuk, observed the site of an ancient city near Turtukar, a village about midway between Œnoanda and Karaeuk (which latter is also an ancient site), and not far from the main branch of the Tàlamàn-su towards its sources. This position corresponds with Cibyra, inasmuch as we are informed that the Indus had its origin in the mountains of the Cibyratis (Plin. H. N. 5, 28), and that it flowed not far from Cibyra itself (Liv. 38, 14). But it is to be hoped that on the positions of Bubon, Cibyra, Sinda, and other places on the confines of Caria, Phrygia, and Pisidia, we shall derive some information from Lieutenant Spratt.

III.—*Expedition to the Lower Parts of the Barima and Guiania Rivers, in British Guiana.* By the Chevalier R. H. SCHOMBURGK. (Communicated by the Colonial Office.)

River Manari (a tributary of the Barima),
22nd June, 1841.

THE expedition under my direction left Georgetown on the afternoon of the 19th of April, in the schooner Home, which had been chartered for the purpose of conveying us to the Waini, or Guiania. After a stormy passage, which the vessel and her crew appeared to be but ill calculated to encounter, we arrived, in the afternoon of the 21st of April, at the mouth of the Waini, where I resolved to disembark our baggage, and selected a bank composed of sand and shells, heaped up by the sea, as the site of our camp. With the exception of some provisions which were damaged, all our baggage was landed in good order.

I resolved on remaining at the mouth of the Waini long enough to fix the geographical situation of that point with some precision, and also to ascertain how far the entrance of the river was navigable. I accordingly commenced a survey, which was completed with the assistance of Mr. Glascott. Although shallows and sandbanks disqualify that river from becoming a resort for large vessels, it may serve for those of less draught; for during high-

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* Supposed by Dr. Cramer to be the same as the Amelas of Pliny.

† At Tremilí we find the ancient name of a people or district attached to a modern town; a conversion, of which examples are found in other parts of Greece.

water there is a navigable channel of from 12 to 18 feet at the bar, and deeper in the basin. It labours, however, like all tidal rivers along this coast, under the disadvantage that fresh water can only be procured at the distance that can be made in a boat with one tide in its favour.

During our sojourn at the shell-bank, I had to send a boat's crew to the river Aruka, a tributary of the Barima, in order to procure drinkable water, which occasioned, in part, the delay of a day and a half. The scarcity of water induced me to dispatch, on the 27th of April, part of our expedition, who were not engaged in the survey, to Cumaka, a settlement of Warran Indians, on the banks of the Aruka; and Mr. King, the superintendent of rivers and creeks, kindly took upon himself to command them. The remainder of the party followed on the 1st of May, after the survey had been completed.

On the 28th of April we received the visit of a Warran chieftain from the Canyaballi, a tributary of the Waini, and about two days' journey from its mouth, who, having heard of our arrival, came with part of his men to visit us. The captain is known among the colonists of this part under the name of Sam Peter, and appeared a very intelligent old man. During the time occupied by the survey the weather had changed, and it now became apparent that the short rainy season had set in. We ascended the Waini to the remarkable passage which connects that river with the Barima; and which, although not navigable for sailing vessels, affords a ready communication, in boats and canoes, between the two rivers. This natural channel may be compared, in some respects, to the Cassiquiare, which connects the Upper Orinoco with the Rio Negro, and it is known in the colony under the name of the Mora Creek. The Warran Indians, who inhabit these rivers, call it Morawan. Where we entered it from the Waini, I estimated its width at 110 feet, and near the entrance we found a depth of 16 feet. During the flow of the tide, the current sets from the Waini to the Barima, and with such a velocity that the steersman has to use precaution not to be swept against trees, which in one or two places obstruct the bed of the river, and are the more dangerous from the winding nature of the passage. Hence, though the depth would permit vessels of from 6 to 8 feet draught to navigate the Mora, its numerous windings and rapid tide render it only fit for boats and canoes. The ebb-tide sweeps with equal velocity through this natural channel, from the Barima to the Waini.

The Barima presented, where we entered it from the Mora, the appearance of a much larger river than I had expected. I estimated its breadth at 700 feet. Its water, still subject to the influence of the tides, was of a dark colour, and its depth from 18 to

24 feet. About 5 miles from the junction of the Mora, the river Aruka flows into the Barima on its left bank. The two rivers, before they unite, are nearly of equal breadth—about 400 feet each. The Aruka has yellowish muddy water. A few houses, inhabited by Warran Indians, are within a short distance of the confluence of the Aruka with the Barima. They, with others who inhabit the Lower Aruka, acknowledge a Warran by the name of William as their chieftain, who resides at the small brook Atopani.

We followed Mr. King to the Warran settlement Cumaka, which is within a short distance of Atopani, and landed there in the evening. We found a large assemblage of Warrans, with their chieftain, William. The Indians were suffering, to an extent painful to behold, from ophthalmia. My previous excursions have made me acquainted with various tribes who inhabit British Guiana or the adjacent territories; but though that disease is by no means unusual among them, I nowhere saw it so frightfully exhibited as here, where at least 50 per cent. of the inhabitants are labouring under it, or have had their eyesight impaired by it. I ascribe it to their inhabiting the low marshy grounds, where it appears they are more subject to colds than in the open savannahs or on the high mountains, and to carelessness.

Cumaka is situated on rising ground. These hillocks, which are the first high ground from the sea inland, form a small chain that extends in a western direction: they are composed of indurated clay, highly ochreous; and, to judge from their vegetation, and the provision-grounds of the Indians on their declivities, the soil is fertile. It is only here that the vegetation on the banks of the river begins to change. Hitherto it consisted of curida and mangrove trees, and numerous manicole palms; but when we had reached the rising ground, we observed noble forest-trees—as, for example, the crab-nut tree, useful for building material; locust, curaliara, siruaballia, soriari, and others. From the curaliara the Warrans prepare canoes and corials; and from the size of these I judge of the height of the trees from which they are made.

Several of the crew were indisposed, and the first coxswain dangerously ill. It was therefore necessary to make a stay of some days at Cumaka, to restore the health of the sick. The skill and assiduity of Mr. Echlin—who accompanied the expedition as artist, but who, by attending the colonial hospitals, has acquired medical knowledge—were therefore in constant requisition. I employed the interval to determine the geographical situation of Cumaka, as a point in the interior on which to rest our pending operations, and to calculate and draw the plan of the river Waini. A native Warran, who spoke the English language imperfectly, was engaged as interpreter.

I resolved, as soon as the general health of my crew was restored, to proceed to the mouth of the Barima for the purpose of examining that part of the river. I engaged six Warran Indians, under the command of the chieftain's son, to accompany us, and we set out on our journey on the 10th of May; and having paddled through the greater part of the night, we landed the following day at the mouth of the Barima, where we encamped not far from Point Barima, on the right bank of the river.

The survey of this river was commenced on the 12th of May. The peculiar features of the river Barima, near its mouth, rendered it difficult to fix on a base-line for the survey. I resolved, therefore, to determine the respective distances of some of its chief points from each other, by intervals, noted by chronometer, between the flashes and reports of guns fired from three stations. Mr. Superintendent King offered his services to the assistant-surveyor, Mr. Glascott, in firing the guns on the 18th of May, when, I am sorry to say, he experienced a severe temporary injury by the explosion of one of them. The survey of the Barima was finished by the 19th of May. It is apparent, from an inspection of the map, that the Barima, near its mouth, labours under similar disadvantages with the Waini; but, if once entered, it offers an uninterrupted navigation to vessels of from 250 to 300 tons burthen, from its mouth to the junction of the Aruka. Indeed, a finer river for steamers could not be desired. Its banks are, however, marshy to its junction with the Aruka; and so much subjected to the tide, that we could not find any spot fit for our night-quarters. It would cost the same labour and expense to bring the lower tracts into cultivation that were required to render the coast land of Demerara arable and productive. Of the upper regions, which I have not yet visited, I can say nothing.

If the difficulty of procuring at all times sweet water could be overcome by building tanks, &c., the Barima and the Waini would offer excellent fishing stations; and the easy communication, either by the sea or by the Mora passage, between these rivers, increases their importance in this point of view. The fish known under the name of querrunai in the colony abounds in these estuaries, and its value is acknowledged, as one in its dry state brings in the market of Georgetown from five to six *bits* (1*s*. 9*d*. to 2*s*. 3*d*.). Of equal, if not greater, value is the morocotto, which frequents the rivers that fall into the Orinoco, and weighs when taken from 10 to 12 lbs. I consider it of importance to point out every resource that the country possesses. These fisheries, if followed up in a proper manner, would no doubt become a useful branch of internal commerce.

The unsettled state of the weather during the period we en-

camped on the Barima made our astronomical observations very precarious. Mr. Glascott and myself, however, succeeded in fixing the situation of the camp to our satisfaction; but, much as I should have liked to extend the survey of the mouth of the Barima to the Boca de Navios of the Orinoco, the unfavourable weather, the state of my crew's health, and the delay which it would have occasioned, prevented me from executing a work which I regard as generally useful to navigation.

We left the mouth of the river Barima on the 20th of May, and arrived at Cumaka, which we had selected as our dépôt, on the following day.

The exposure to the heavy rains, which had set in, did not fail to show its influence on the crew, and five were reported on the sick list. The 27th of May arrived, therefore, before we could start for the Amacura. Mr. Glascott, the assistant-surveyor, being indisposed, he remained at Cumaka, and I was only accompanied by Mr. Echlin.

Thirteen miles from Cumaka, in a southern direction, the Aruka is joined by the Aruau, by means of which the portage is reached which forms the communication between the rivers Aruka and Amacura. I resolved, however, to follow the Aruka some distance beyond the junction, in order to visit a Warran settlement, and to become acquainted with the character of the upper course of that river. It decreases materially in size, being scarcely more than 30 yards across; its banks, still swampy, are studded with manicole and truti palms, along the stems of which we saw the aromatic vanilla trailing in large quantities, forming natural festoons, and its numerous white flowers diffusing a delicious perfume. The water of the river was of a jet-black, and so clear, that it was difficult to detect where the reflected image, which the trees and shrubs bordering its banks cast into the river, separated from the real object. It was late in the evening before we reached the Warran settlement, which consisted of eighteen individuals. Another village of fifteen inhabitants was higher up, which, it appears, is the highest inhabited place on the Aruka; that river having its source about 15 miles farther S.

The inadequacy of my crew for the pending journey, in consequence of several having been left sick at Cumaka, made it necessary that I should engage some Indians to assist in transporting the corial across the portage and through the smaller creeks, and three Warrans were accordingly engaged for that purpose.

We returned next morning to the junction of the Aruau with the Aruka, and, following the former river upwards, reached in the evening the portage, whence we had to transport the corial to one of the rivulets which flow into the Amacura. The ground

rises here to about 40 or 50 feet, and, extending from N.W. to S.E., forms the watershed between the small streams which flow into the Amacura and the Barima. The portage is somewhat more than a mile long, in a S.W. direction. The size of our boat, and the narrowness of the path, were such, nevertheless, that our crew were occupied nearly two days ere they had got the corial across to the river Yarikita, which falls into the Amacura. The soil consisted of rich loam; and I observed several trees useful for naval and civil architecture, as the crab-wood, siruadallia, soriari, mora, and many others. One of the mora-trees astonished me by its gigantic size.

If a more dense population and increased industry were to render it expedient, there would be little or no difficulty in connecting, by means of a permanent watercourse, the river Barima with the Amacura. This might be effected by cutting a canal across the portage. The soil, as already observed, is an ochreous clay, and, with the exception of a few blocks of granite, which no doubt have been transported by water, there is no rock *in situ* that appears to offer obstructions to such an undertaking. The course of the Yarikita is W.N.W. towards its junction with the Amacura. After having been joined on its left bank by the small rivers Waina and Wayuma, it increases considerably in size. The botanist would have been here much delighted by a diversified and interesting Flora. Orchideous plants, the *Peristeria* (or flower of the Holy Spirit); several *Epidendra*, with scarlet blossoms; and many others of equal interest, adorned the trees. A *Crucian* with white flowers and a delicious perfume bordered the banks; *Bignoniacea* trailed along the trees; and the *Braonea racemosa*, which has been compared to our rose, added to the variety by its bright scarlet colour, especially when contrasted with the green of the surrounding shrubs and trees. The river is subjected to the influence of the tide, which, it appears, rises here about 2 feet. A short distance from its junction with the Amacura there are some hills on its right bank, of the height of about 500 feet They are called Manibari, and were the highest we had seen since we left Demerara. On the left bank, and close to the confluence, is the hillock Arikita, less elevated than the former. We entered the Amacura at two o'clock in the afternoon, and, following its course downwards, reached at five o'clock in the evening the mouth of the rivulet Otucamabo, flowing into the Amacura on the right or eastern bank.

We ascended it, in order to pay a visit to Assecura, a settlement of Arawaaks and Warrans, under the Arawaak chieftain Jan. We were received in a very friendly manner; and found in him an intelligent man, who spoke the Creol-Dutch perfectly. The settlement consisted mostly of Arawaaks, and only a few Warrans.

The greater cleanliness in person of the former, compared with the latter, was striking. We did not observe among any of the Arawaaks (whether children or adults) those tumours which are caused by an accumulation of chigoes, and which, being neglected to be extracted in time, render many of the Warran children lame: indeed, as the chigoes penetrate other parts as well as the feet, these poor children not only suffer the greatest pain by the neglect of their parents, but are rendered in their appearance positively offensive. This was not the case with the Arawaaks, among whom the filthy state of the Warrans is proverbial; nor did they suffer from those ophthalmic complaints, which I have mentioned as being so common to the Warrans of these rivers, and of which the extent has been under-rated in the statements that even fifty per cent. of them suffer under it.

With Captain Jan of Assecura as a guide, and our crew increased by several of his followers, we left the settlement on the 2nd of June, and now ascended the Amacura. After having passed the Yarikita, which we had descended two days previously, we found that the Amacura decreased materially in size, shrinking in the course of the day to a mere stream. We ascended at five o'clock in the evening the stream Curriyabo, which joins the Amacura on its western bank, where we intended to halt during the night at a Warran settlement, it having rained incessantly and in torrents during the whole day.

The Indians have all withdrawn from the banks of the Amacura, and selected small streams for establishing their settlements upon. These streams are almost allowed to be grown over, so those only who are well acquainted with their navigation would suppose them to be inhabited by human beings, or be able to reach their abodes. The intricate navigation rendered it very difficult to make any progress in our large boat.

The settlement consisted of only twelve individuals; but there are several other settlements in the vicinity; and about forty Caribs live in the neighbourhood. The whole population, including the Caribs, amounts nearly to ninety persons.

The next day (June 3rd) proved so rainy that we were obliged to remain stationary. We started, however, on the 4th of June, to continue the survey of the Amacura to its falls or rapids, which are caused by a ledge of granitic rocks that cross the river, and impede its farther navigation. It had dwindled, the previous day, to a stream; but the torrents of rain which had fallen lately rendered it impetuous in its course. Near its mouth the Curriyabo is only divided by a short neck of land from the Amacura, which latter river has still low banks, and is quite serpentine. As we advanced I found its banks increase in height, and become

studded with noble forest-trees. The gorgeous flowers of the *Brownea racemosa* and *Gustavia angustifolia* were so abundant that they added considerably to the beauty of the sylvan scenery.

A few miles above the junction of the Curriyabo with the Amacura, the stream *Tusa* joins the latter river on its right bank. It appeared to be of the same size as the Amacura. The course of the Amacura is much farther westward in ascending than it is laid down on the maps. Our course was to-day generally W.S.W. to the fall of Cuyurara. This fall is about 12 feet in perpendicular height; two other falls are higher up; and the whole descent may amount to about 30 feet. The small size of the river renders the aspect of the falls by no means imposing; and it may be said that the Amacura, above its junction with the Yarakita, is only fit for the navigation of the small boats of the Indians.

We did not proceed farther, which in our large boat would have been impracticable; nor did it appear to me that I was so far warranted in risking the health of the individuals who accompanied me, as to prosecute the stream's course in small boats, where protection against the inclemency of the rain proved impossible. Astronomical observations were out of the question; for, from the time of our departure from Cumaka, we had seen neither sun nor stars. There are no more inhabitants at the banks of the Amacura than on its tributaries beyond the junction of the Curriyabo; and, according to the evidence of the Indians, who pretended to have been at the source of the Amacura, it is about 2 days' journey, in their small boats, above the fall Cuyurara. The 5th of June saw us on our return to Assecura.

On leaving Cumaka I had only provided myself with a chronometer, a sextant, an artificial horizon, and prismatic compass. The unfavourable state of the weather enabled me only to procure one observation of the sun for the chronometer on the morning of the 6th of June; and ten days having elapsed without any intermediate observations, I could not depend upon its rate. However, I had desired Mr. Glascott (who in consequence of indisposition had remained at Cumaka) to fire, at 6 o'clock on the evening of the 6th of June, three guns, which we distinctly heard at Assecura. We thus procured the direct compass-bearing of Cumaka; and combining this with my observations for latitude, I obtained, as the result, the difference of longitude between Cumaka and Assecura.

I was fortunate enough to procure here and at the Upper Amacura a large supply of Indian provisions, for which we paid, to the full satisfaction of the Indians, in such articles as they most desired—namely, cutlasses, knives, calico, salempores, beads, &c. The provisions which we had brought with us from George Town

being nearly exhausted, this supply was very welcome; and as I had received information from Mr. Glascott and his party at Cumaka that they were short of provisions, I despatched a large supply by two small canoes, across the portage of Yarikita.

We left on the 7th of June, on our farther descent to the mouth of Amacura. The Arawaak, Captain Jan, who went with us to the Upper Amacura, and who proved himself very useful and intelligent, accompanied us farther, as his knowledge of the localities, and the names of streams which fall into the Amacura, rendered his services valuable. The streams which join the river from its eastern or right bank are very numerous; and it increases materially in breadth: I state its average depth at its lower course as 18 feet, though there are places which much exceed that depth. A peculiar feature in this river are large patches, consisting of matted grass, the splendid blue water-lily (*Ponthederia azurea*), and several other water-plants, which, torn off by the increased stream during the rainy season, come floating down with the current, and reaching that part of the river where it is subjected to the tides, they are carried to and fro, as the tide may be flowing or falling. We might have numbered thousands of these little floating islands. We reached, in the afternoon at 3 o'clock, the Coyuni, which, like the Mora from the Waini to the Barima, and *vice versâ*, offers an uninterrupted passage in canoes from the Amacura to the Araturi. The Coyuni connects the Amacura with the Waicaicaru or Bassama, which falls into the Araturi. This river flows, opposite the island Smataca, into the Orinoco; and is another instance of a remarkable connexion between the tidal rivers of this coast.

There is no doubt that the Amacura is navigable for smaller vessels and steamers to the Yarikita; the bar at its mouth, and the inconsiderable breadth, which seldom amounts to more than 300 yards, render it unfit for larger vessels. It abounds in that delicious fish morocotto.

It was late in the evening before we reached the mouth of the Amacura. We arrived on the 10th of June at Cumaka, where, to my great satisfaction, I found the invalids mostly restored, and Mr. Superintendent King rejoicing in his recovered eyesight.

Although the rainy reason has for some time past set in, and although our stores are materially reduced, and we have been deprived of many comforts, I yet deem it my duty to persevere, and continue the survey to the Cuyuni. The two large corials, which we are not able to transport across the sand, have received orders to proceed round the coast to Essequibo, and to remain at Bartika point, while the coxswain was to meet us with some small canoes, and a supply of the most necessary provisions, on the

Cuyuni. As far as I can foresee, three or four weeks may elapse before the expedition can return, for refitting, to George Town. The map will point out more clearly the route which we have taken; though I cannot omit to observe that more unfavourable weather for astronomical observations we could not have had than we have experienced during this expedition.

IV.—*Excursion up the Barima and Cuyuni Rivers, in British Guiana*, in 1841. By the Chevalier R. H. SCHOMBURGK. Communicated by the Colonial Office.

Demerara, August, 1841.

THE party under my command left Cumaka, where we had sojourned for some time, on the 15th June, and having arrived at the junction of the Aruka with the Barima, we continued the ascent of the latter river in an east-south-eastern direction: we reached, next day, its junction with the Kaituma, which falls in on the left bank from the S.; and is at its mouth about 200 feet wide. The Kaituma is inhabited by Warran and Waika Indians; and is connected with the upper Barima by several intermediate brooks.

Numerous rivulets join the Barima on both its banks; some of them inhabited by Warrans. It has still, however, the appearance of a tidal river, being margined by mangrove and curida bushes, over which manicole and truli palms raise their heads. Its banks form continued swamps, which only can be made arable through the industry of man.

We encamped in the night between the 15th and 16th of June at a Warran settlement, the chieftain of which called himself Marawari. The noise of the Indian drum and songs, on our approach, announced that the inhabitants were revelling; and on landing we had sufficient evidence that Marawari was intoxicated. One of his wives was in the same state; and thus we witnessed, for the first time since we had left the European settlements, the effects of that horrible vice, drunkenness. Marawari's settlement consisted of five huts, surrounded by rich provision-grounds; and I observed with pleasure some lemon and lime trees near the houses. Their provision-fields abounded in cashew-nuts (*Anacardium occidentale*).

We passed, on the following day, the small river Maruiwa, or Whomana, which, by the interlacing of a number of other rivulets, affords a passage in boats from the Barima to the Waini, a journey which the Indians effect generally in two days. At a short distance

above the junction some hillocks rise on both banks; they are the first which are met with on the Barima. The Warran chieftain Clementi had selected one of them to build on its summit a large hut, which, by its construction and neatness, distinguished itself from the generality of Indian houses. The erection of this house, with its gallery in imitation of a second story, was the more gratifying, as he did it to afford accommodation to the superintendent of the district on his periodical visits; the good effects of which, as exhibited in the character and better conduct of the Indians in their social intercourse, I had several times opportunity to witness.

I availed myself here of a favourable moment to determine the position of the place; an opportunity which the unfavourable weather had not previously afforded us since we left Cumaka. Warina is, according to my observations, in latitude 7° 50′ 15″ N., and longitude 59° 43′ 30″ W.: and the height of the house we had selected for our night-quarters was about 70 feet above the Barima. The chain of hillocks, on one of which the house was built, extends, in longitudinal ridges, in a N. and S. direction, N. 12° E. and S. 12° W.

I always considered it my duty, wherever an opportunity offered, to observe how far the geological structure of the country might be favourable to cultivation; it being undeniable that the quality of the soil depends generally upon the rocks which form the strata below the arable land. The super-strata at the hills of Warina consist of ochreous clay, intermixed with mould, pebbles, and that due proportion of sand which would particularly qualify it for the cultivation of coffee. The large blocks of ferruginous clay which lie dispersed on the surface ensure the necessary moisture for the cultivation of that plant; for it is well known to the agriculturists how beneficially such blocks operate on the soil on which they lie, contributing not only to the retention of moisture, which would otherwise evaporate, but to the precipitation of atmospheric vapours.

The rivulet Curiye offers another medium of communication with the Maruiwa and the Waini, but it can only be navigated in small boats.

We passed, at 9 o'clock on the 18th of June, the river Amissi, which joins the Barima on its left bank. It is of considerable size; and at the junction of the two rivers, the Amissi appears the larger of the two. The Indians, however, informed me that its course has not the length of the Barima, and that its banks are mostly swampy: the current appears insignificant.

During the rainy reason the influence of the tide is felt to this point; in the summer months it is felt still higher up. The swampy banks of the Amissi are unfit for habitation. Even the

Warrans, whom the earlier authors of travels described as living on the tops of trees, but who in reality raised only a platform just above the level of the water, and rested their miserable dwellings on stumps of ita-trees, prefer now higher ground to build their huts upon. The Amissi affords, by natural canals, a communication with the river Kaituma.

Since we had left Warina, our course up the Barima lay more to the S.W.: the banks of the rivers became higher; while the palms and mangrove bushes, which till now had been so numerous, became less frequent, and were replaced by a more varied vegetation. Our Indian guides informed us that, by ascending the rivulet Yarumuku half a day, we would reach high hills and savannahs. We continued, however, the ascent of the Barima, and passed the rivulets Aruta and Pegua; the latter inhabited by Warrans. The Barima narrows above this creek to 40 yards, and flows with a strong current, which impeded our progress: its depth was still from 3 to 4 fathoms. The banks (it being now the middle of the rainy season) were full to overflowing, and rose scarcely a foot above the water's edge.

In lieu of palms, the most stately mora-trees overshadowed the river. In all my former travels in Guiana I have nowhere seen trees of this description so gigantic as on the land adjoining the Barima at its upper course. Indeed, frequently, when our boat rounded some point which the river made in its course, and a long reach was before us, these majestic trees appeared in the background as hillocks clothed with vegetation, until a nearer approach showed our mistake; and we found that what we considered to have been a hillock was a single tree, rising to the enormous height of 130 to 150 feet; forming by itself, as it were, a forest of vegetation. The importance of the mora in naval architecture is now fully recognised in Great Britain, and a new export trade has been opened to the colony. On the upper Barima this tree is so abundant, and grows to such a size, that the whole British navy might be reconstructed merely from the trees which line its banks; a circumstance well worth consideration, for the river being navigable to vessels of 12 feet draught, the craft intended for the transport of the timber might load at the very spot where the trees are cut down. It is only lately that the timber of Guiana has come into notice in England; but so superior is the mora and the green-heart for objects of naval architecture, that a higher price is given for them in sea-port towns than for any other wood imported into England.

It appears that, at the commencement of this century, a white man, very likely a Dutch settler, had advanced so far as the Huena river. The Indians showed us the place where he had cultivated sugar; and they told us that he had possessed a

schooner and several punts, with which he carried on a timber trade. The Indian, in his expressive language, called the former settlement "the last place of the white man."

We entered, on the 19th of June, the Caruwava or Caruawa river, a tributary of the Barima, and halted at a settlement of Warran Indians. While among the Warrans I had heard much of one of their games which they exhibit on festival occasions, and here I had the satisfaction of witnessing it. It is played in parties, two against two. and the champions, painted and dressed in the distinguishing modes of their tribes, show their athletic skill by attempting to push each other from a space of ground by means of the *haha*, which resembles a shield. It appeared to us an innocent pastime, which gave agility to their limbs, and displayed to the greatest advantage their muscular power and fine proportions. There are several Warran settlements on the banks of the Caruwava: I estimate their number at 200 individuals.

The Manari, a river with a stronger current than the Caruwava, joins the latter on its left bank, at the distance of about a mile from its confluence with the Barima. The Manari is mostly inhabited by Warrans; but there is a settlement of Waikas about 5 miles up, where we intended to stay for a few days. From this settlement a path led overland to the river Barama, and thence to the Cuyuni; and it consequently became necessary to select it as a starting-point. Our larger canoes, being much too bulky, were now of no further use; and as the official duties of Mr. King, the superintendent of the country, required his speedy return to George Town, I resolved on sending the two canoes, with such of the crew as I considered not qualified for the fatigues of an overland journey, under his command to the coast. We landed at the settlement Manari in the afternoon; it consisted of five Indian houses, the largest of which was given up to us to reside in.

I have already alluded to the sluttishness both of the persons and dwellings of the Warrans; and mentioned how superior the Arawaak Indians were in that respect. The Waikas are perhaps even superior to the Arawaaks; the cleanliness of their person and domestic arrangements was a gratifying picture, after having travelled for months among the Warrans. The Waikas are much fairer in their complexions than the Indians who inhabit the coast regions; whom they also surpass in athletic form and regularity of features. The Warrans indulge in bigamy; I met even several instances of polygamy among that tribe. It is different with the Waikas, whom I found uniformly united to only one wife.

The land adjoining Manari is wonderfully productive. We saw sugar-canes vying with the best on the coast; Indian corn, or maize, far surpassing any ever produced at the coast regions; and

bunches of bananas weighing from 80 to 100 pounds. The superstratum is a rich loam, intermixed with vegetable earth and sand; and, as it lies upon clay, sufficient moisture is always retained to advance vegetation.

Mr. King, and those of the party who were to return with him, left Manari on the 22nd of June. The provisions were at that time much reduced, and the period of the year did not warrant me in supposing that I would be able to get much from the Indians. I desired, therefore, that the boat of the expedition should proceed up the Essequibo, and await the land party at Bartika point, from whence a supply of the most necessary provisions should be sent up the Cuyuni, in a smaller corial, to meet us. This service was confided to the second coxswain, Claas van Cornelinsen.

I was anxious to examine the Barima beyond its falls. I started accordingly, on the 24th of June, in a small canoe accompanied by Mr. Glascott, the assistant-surveyor, and Mr Goulin, the artist of the expedition. Descending the Manari for a short distance, we reached the Barima by two of those natural canals (the Gaima and Ataima) which so frequently connect rivers having a parallel course in these swampy regions. The almost continual torrents of rain had caused the Barima to overflow its banks, and we found the current running at the rate of from four to four and a half miles an hour. Our progress was consequently slow. A short distance above the off-flow which connects the Barima and Manari, we visited a Warran settlement called Emu, where we admired a gigantic bamboo, several hundred yards in circumference.

We found two of the Indians finishing a native canoe, which they had cut out of cedar (*Icica altissima*), a species of wood uncommonly well qualified for that purpose, and resembling, in its durability, odour, and reddish colour, the famed Bermuda cedar, although a genus quite distinct from the icica. As the cedar-tree of Guiana is by no means scarce, it deserves more attention.

The Warrans are famed for their skill in finishing canoes out of the single trunk of a tree. They formerly furnished the colonists, as well as the tribe of Indians inhabiting the coast regions, with canoes and corials, which for durability and speed far surpassed any boats ever introduced from Europe. Of late years their industry has much relaxed. The celebrated Spanish *launches*, employed during the revolutionary war of Venezuela, were made by the Warrans. Some of these were roomy enough to contain from fifty to seventy people.

We passed the small rivers Ararisi, Yabritin, Burroparu, Mariawaballi, and landed, on the evening of the 25th of June, at the

Warran village, Simuita. We here measured the breadth of the river, and found it 51 yards. The river Kaituma flows, about 9 miles distant, in a N.E. direction. The barometer stood, at 6 hours A.M., 30° 0′ 20″ English inches; the thermometer at 70° 5′ Farenheit.

We were accompanied by a number of Indians from Simuita and the neighbouring settlements, who intended to ascend the river to the falls, to shoot the delicious fish called maracotto, or ossibu, which, at the time these waters are full, migrate beyond the falls for the purpose of depositing their spawn. We formed a flotilla of boats, our canoe being the leading frigate. Several fish were procured on the first day. In order to attract them to the shore, a number of the seeds of the carapa, or crab-nut, are pounded, and having been enclosed in a netting of withes, they are put in the water, and soon attract the greedy maracotto. An Indian stands ready with a light spear, which he lances into them, one after another, with unerring aim. The maracotto frequently attains a length of 30 inches, and is 26 inches in girth. Its flavour is delicious.

We observed, on the 27th of June, a tract of sandstone, which was heaped up in numerous blocks. It is fine-grained, and much used by the boat-building Warrans to sharpen their tools.

We arrived in the afternoon at the fall Mekorerussu, which presents the first impediment to the navigation of larger vessels on the river. A few miles below the falls we found a depth of 3 fathoms. The Barima is therefore navigable so far for steamers of considerable size, although for sailing vessels the voyage would be tedious, in consequence of the serpentine course and strong contrary current.

The Indians inhabiting these regions were not aware that white men had ever penetrated so far before. We might have commenced our return here, more particularly as the weather was so unfavourable, but I found the course of the Barima so different from what it is laid down on the maps, that I considered it of consequence to trace it higher up. The rainy season rendered the Barima navigable for a greater distance in the direction of its source than would have been the case at any other time, and I therefore resolved to continue until we could proceed no further in our corial.

The first series of falls were ascended without any accident, and we halted the same evening near some temporary huts, which certain Waikas from Manari had erected opposite to a place where they intended to found a new settlement. Although months had doubtless elapsed since any human beings had sojourned in these huts, we found them swarming with fleas and chigoes, which made us soon relinquish the idea of using them for our night's quarters.

We passed, in the course of the next day (June 28th), numerous rapids, of which one called Uropocari was the largest. The river was undiminished in breadth, but studded with rocks. We passed in the afternoon a large rivulet with black water, called Duquari. It comes from the W.N.W. I afterwards observed stratified quartz, and could not but admire some huge blocks of granite which rose above the level of the river, and are called by the Indians Arauta. Their shining surface and symmetrical form were equally remarkable.

The river Wanama—so named from a species of bamboo which grows at its mouth, and which the Warrans call Wanama—joins on the left bank, and is one of the largest tributaries of the upper Barima.

About half a mile farther S.W., the river Mehokawaina unites with the Barima. Both tributary and recipient are, before their junction, of the same breadth. The Mehokawaina comes from the S.W., and the Barima proper from the W.

I now found it advisable to discontinue the ascent in corials, for numerous trees which had fallen across the Barima obstructed the boats. Leaving Mr. Glascott in charge of the camp formed at the junction of the two rivers, and having armed the most effective of the crew with cutlasses and axes, we cut our way through entangled bushes and swamps, following the left bank of the Barima. With the exception of two rivulets, we found the tributaries which the river received of inconsiderable size. Its bed is frequently traversed by granitic dikes, over which the water precipitated itself impetuously; and its current was so rapid that it would have been difficult to make any way in ascending, even in a small corial.

I admired the number of noble forest-trees, among which I observed the bullet-tree, the locust-tree, the crab-wood, curahara, itapu, cuyama, yarura, and its allied species, parnacussana; the suari or impa, and makaratalli. But the most remarkable appeared to me the tunkara, which measured in circumference from 28 to 30 feet. Its trunk rose free from branches, smooth and round, to about 70 or 80 feet; and I was told by some of my Indian guides that the Warrans used the tree for making canoes. It is soft and white, and the colonists prepare staves from it. The Warrans make their bark or shell canoes of the bark of the bullet-tree and makaratalli.

Incessant rains rendered our travelling through the woods and over swampy ground by no means comfortable. We continued our march next morning (the 1st of July), and passed a large rivulet. which, having no native name (for the Indians of the inhabitable part of the Barima, below its falls, never ascended so far), was called Rocky River, from the numerous blocks by which its course was obstructed.

Our stock of provisions being now completely exhausted, we stopped here. I halted at eleven o'clock, and returned to the spot where we had encamped the previous night, under severe rain and thunder. The river was about 30 feet wide where we turned back: its course was W.N.W., and frequently obstructed by rapids and falls. The adjoining land on either side was fertile, consisting of clay mixed with sand and vegetable earth. The forest scenery was luxuriant, and hillocks of inconsiderable height, perhaps not more than from 50 to 60 feet above the Barima, appeared particularly adapted for the cultivation of coffee and cocoa. We reached the camp at the junction of the two rivers next day. Mr. Glascott during my absence had only succeeded in his meteorological observations; the unfavourable weather having prevented him determining the geographical position of the camp astronomically.

	Barometer in Inches.	Thermometer.					
		Attached.		Detached.		Wet.	
		°	'	°	'	°	'
Highest . . .	30·088	80	5	80	0	78	5
Lowest . . .	29·942	71	4	71	0	70	0
Mean of 37 Observations, from 6 A.M. to 6 P.M.	30·007	75	56	75	30	74	02

Having once more reached the corials, we floated down the river. Our return was rapid: it had taken us six days to ascend from Manari to the Mehokawaina, and we accomplished our return in 2½ days.

Our departure from Manari was retarded by the sickness of the first coxswain, Peterson, who was so seriously indisposed that Mr. Echlin, our artist and physician, reported him unable to journey with us overland.

From the information I had collected, the road threatened to be of the most fatiguing description. And as I was anxious that the chronometers, of which two had hitherto kept a fair rate, should reach the coast regions in safety, in order to prove by remeasurement to George Town how far the observations taken by their means were to be trusted, I desired Mr. Glascott, the assistant-surveyor, to proceed with the coxswain by water to the coast, while Mr. Echlin, and the men best fitted for such an undertaking, accompanied me overland to the river Cuyuni. I had

another object in view in sending Mr. Glascott by the route alluded to; for should the weather prove favourable, he might be able to determine by astronomical observations some of the more important points on the coast.

According to our observations the settlement Manari is on 7° 35′ 34″ N. lat., and 60° 0′ 36″ W. long., or 109 miles W. of George Town.

The extract of our meteorological observations gave us the following result:—

	Barometer in Inches.	Thermometer.					
		Attached.		Detached.		Wet.	
		°	′	°	′	°	′
Highest . . .	30·176	89	0	88	8	83	4
Lowest . . .	30·018	72	2	71	5	68	0
Mean of 37 Observations, taken hourly . . .	30·092	78	5	78	0	75	2

We were joined by a number of Warrans and several Waikas from Manari, whose services we had engaged to assist in carrying our luggage from Manari to the Barama, which flows into the Waini. We were told that we would have to ascend the Barama in boats for four days before we should reach the path that leads to the Cuyuni.

An Indian carries scarcely more than 24 lbs. weight on journeys overland. While the negro carries invariably his burthen on his head, experience has taught the Indian that by doing so he would not be able to make much progress through the thick woods, and his load is therefore slung on his back; for that purpose they have baskets which are made of the stems of a calathia, or of some species of palm.

Our preparations had been completed, the loads distributed according to the appearance of strength possessed by our carriers; and after Mr. Glascott had left with his party, in a boat which was hired for the purpose, we commenced our march overland on the 8th of July. The forest through which we now proceeded appeared to have less underwood; and I observed numerous specimens of that valuable tree the siruaballia, which affords one of the best timbers for the planking of vessels and the construction of gigs, boats, &c. I saw trees of this description of which the trunks might have measured 70 feet before they branched off.

The cedar and other forest trees, many of them of the most gigantic dimensions, were seen in great numbers during the course of this day's journey, besides numerous hya-hya trees. The hya-hya is the remarkable tree which yields by incision a milky fluid that forms a good substitute for cow's milk. The Indian, to whom it is inexplicable how man can make use of milk after having been weaned from the maternal breast, does not attach any value to this fluid as an article of food, but the younger community prepare from it balls of caoutchouc.

Our path led over hillocks from 50 to 60 feet high, extending in longitudinal ridges: their intermediate valleys generally formed swamps; on crossing which we frequently sunk to our girths in mud and water. After 4 hours' march we crossed the Caruawa, here a mere rivulet; and arrived in the afternoon at a small settlement consisting of two houses inhabited by Waikas.

In the morning I had the mortification to find that the mountain-barometer which I had brought with me had suffered materially from the land journey, and was for the present unfit for use. After a march of 2 hours we halted at Paripu, a settlement likewise inhabited by Waikas. The cassada grounds around the settlement were extensive, and the size of the plantains and of the Indian corn or maize struck me with astonishment. Some of the ears of the latter were 12 to 13 inches in length; those which grew on the coast regions do not exceed 5 inches. The soil is here a rich black mould mixed with white sand, and would produce anything. To prove the importance of the maize, I would only observe, by the way, that the cereal grain imported from the United States of North America into the British West Indian colonies amounted in the year 1836 to 126,680 bushels, the corn meal to 36,168 barrels; and that the value of both was 61,341*l.* sterling.

The neatness and order of the provision-fields around these settlements showed that the Indian who presided over them was distinguished from the generality of his brethren. Paths led through the fields; the yams were trailed against poles; lime and orange trees, so seldom to be met with amongst the Indians, increased the favourable idea I had of the inhabitants. We found only one Indian and some females at home; the rest, with their chieftain, were gone to work for a time at a wood-cutting establishment on the river Pomeroon with a view to earn money to procure those articles which have become almost necessaries of life with them, namely, wearing apparel, implements for cultivating their fields, guns, powder, and shot.

Leaving Paripu we continued our march; and in the afternoon of the same day arrived at another large settlement, judging at

least from the number of the huts. Here also the male inhabitants were absent, having gone to work at the Pomeroon.

While passing through the village I noticed at the further end a house which appeared to be uninhabited—two heaps of ground thrown up near the middle of the house, and one, covered with a large earthen vessel, attracted more particularly my attention. I made inquiries, and learned that they were the graves of a father and his child,* both of whom had been killed by the malpractices of a piaiman or conjuror. When is the period to come at which the Christian religion shall enlighten these poor benighted beings, and prevent the recurrence of such dreadful scenes, with the effusion of blood in their train? The accusation that the victim has died through the agency of a piaiman is sufficient to awake an avenger of the deed among his relations.

After we had passed the village, we had to wade to our necks for upwards of a mile through water. The rivulet Parapimai had inundated its shores; and as the rain descended in torrents, we were glad when, towards evening, we arrived at the Caribisi settlement Cariacu, situated on the banks of the Barama, which is here about 60 yards wide. The Barama flows about 40 miles further, below, into the Waimi, and is the largest tributary of that river. It is inhabited by Waikas, Caribisi, Warrans, and a few Arawaaks, whose aggregate number I estimate at 500 individuals. The men at Cariacu, like those at the two settlements previously passed, were absent at the wood-cutting establishment on the Pomeroon, and we found only a few of the females, who, with a Carib, had been left in charge of the place.

Several of my Indian carriers and guides declined going any further. I had to replace them from among the Caribisi and Waikas of the vicinity, which occasioned a delay of two days. The weather during this period was so unfavourable, that I could not obtain astronomical observations. We had to ascend the Barama to a distance of 4 days' journey from this point, before we should strike the path which leads to the Cuyuni; and as there was only one boat to be had, which afforded place to four individuals, we had to betake ourselves to shell or bark canoes, called by the colonists of Demerara *wood-skins*, and by the Spaniards conchas. They are made merely of the bark of divers species of trees; that portion being stripped off, and manufactured into the boat. They are generally from 25 to 30 feet long, and when laden, seldom draw more than 3 inches of water: light, and of the most simple construction, they can be easily carried on the head, over rocks and other impediments which might obstruct the navigation. Indeed, they are the only craft with which the Indian navigates the upper parts of rivers; but they are dangerous, and

require proper management, for a false movement when sitting in one of them may cause it to sink. However, we could procure no other conveyance, and confided our persons and luggage to these frail vessels.

We departed from Cariacu on the 11th of July. The Barama resembles much the upper Barima; its banks are clothed with a similar vegetation, and it is equally serpentine in its course. I noticed a good deal of potter's clay, used by the Caribisi for the manufacture of pottery, which for its durability is highly esteemed by the colonists. This clay has a greyish colour, and is mixed with the loose materials of decomposing granite.

The rivulet Nakuwai was the largest tributary which we passed in the course of our first day's ascent; it joins the Barama on its left bank. We noticed the first rocks lying in the river's bed above the rivulet Abocotté. About a mile and a half above this, the Erawanta and Mazuwini join the Barama close to each other. During the rainy season, when the bed of the river is full, it forms numerous off-flows, which adopt a more direct course than the river itself, and join it again at some distance on. The Indians who are acquainted with these branches, navigate them, and thus shorten the ascent materially.

We passed, on the afternoon of the 13th of July, some hillocks, and, soon after, the first rapid, formed by dikes of granite; and reached a settlement of Waikas, called Cadui, which we were told was the last inhabited place below the great fall. We were here struck with an air of plenty; the cassava grounds were extensive; yams, sweet potatoes, plantains, and bananas were abundant; also the paripi palm, and papayas, of which the fruit resembled a large melon, some of them measuring 28 inches in circumference. Sugar-cane, cashew, and cotton-trees grew around the huts. A number of wild fowls was observed; moridies, powies, parrots of all plumage; several sun-birds, all tame, and associating amicably with one another.

I succeeded in procuring a set of circum-meridian altitudes; according to which the settlement was in 7° 19′ N. latitude. We heard quite distinctly during night the roaring of the great fall Dowocaima, which is about two miles distant, and bears S. 58° W.

Having engaged three more Indians to accompany us from Cadui to the Cuyuni, we started next morning at an early hour; and after passing some rapids, approached the great fall. We had to unload near the island Wayaruima, and carry the canoes and luggage 2 miles overland.

These cataracts surpass in grandeur the great falls of the river Demerara, to which in their structure they bear some resemblance. The whole fall on the Barama amounts to about 120 feet in a

distance of 2 miles; but, from the sinuosities of the channel, there is no one point which affords a *coup-d'œil.*

The grandest scene is offered by the three upper falls, where the river, narrowing into about 80 feet, rushes turbulently down the precipice in three jets, and forms, in the distance of about 100 yards, a fall of 35 to 40 feet perpendicular. This part is called Dowocaima, and, as we saw it at the height of the rainy season, when the river is full to overflowing, the scene is sublime indeed. The banks were bordered by a primitive forest, and foliage of every hue: among which the bright red of the young mora-leaves formed a striking object. Lianes, reaching from boughs 60 feet high down to the water's edge; a thousand creepers, so closely enveloping whole rows of trees as to give them a fanciful resemblance to old massy columns crowned with ivy; white festoons and clusters of purple and yellow salver-shaped flowers trailing from tree to tree; all combined to form a vivid picture of tropical vegetation. The uproar of the masses of water which rush over the ledges of rock, and envelop in foam the surrounding scenery, added to the characteristic features of the landscape.

The ledges of rock are composed of gneiss, their stratification being S. 33° W.; they form an impediment to all further navigation, and are such as, if a denser population should render the step necessary, could only be overcome by canals or railroads. In the absence of these, our Indians took their light bark canoes on their heads, and carried them to that part of the river where there were no serious obstacles to its further navigation.

We passed next day the rapid Massiwinidui, and several others of less consequence, and encamped in the evening at the foot of the fall Aunama, from whence the path leads to the Cuyuni. The river Aunama joins the Barama just below the fall. The latitude I determined to be 7° 14′ N. At a day's journey above this fall there is a Caribisi settlement; further up the Barama is uninhabited. It is said to have its source on the same parallel of latitude with the Barima and Amacura; namely, in the extensive savannahs N. of the Ikruyéku mountains.

We commenced our over-land journey on the morning of the 16th of July, and traversing occasionally hillocks from 100 to 150 feet high, followed the valley through which the small river Aunama flows towards the Barama; we reached at noon an Indian settlement. The provision-grounds around it were in good order, but the houses were tenantless. From this point our tortuous path continued in a W.S.W. direction, still following the Aunama. After a march of 6 hours, we arrived in the afternoon at a settlement of Caribisi Indians, called from the rivulet on which it is situated Aunuma, and, according to circum-meridian observations of the * α Gruis, in 7° 9′ N. latitude. On the ridges which we

were this day crossing, and which generally stretched N. by W. and S. by E., I observed several tracts of granitic blocks, the direction of which was N.W. by W. The trees we met with on our journey were lofty, and there was less underwood than along the banks of the rivers. The mora, which had been so abundant, became scarcer the further we receded from the Barama, and was replaced by a great variety of timber-trees, as kakaralli, determa, limaballi, cedar, &c. We did not observe any green-heart, a wood much esteemed by shipwrights and housebuilders.

Our course on the 17th of July continued W.S.W. We crossed, at ten o'clock in the morning, the Aunama for the last time; and having passed a ridge of small hills which stretched S. by W., we stood soon after on the western branch of the rivulet Acarabisi. We had now reached the most elevated spot between the Cuyuni and Barama, and entered another system of rivers, the waters of which, instead of flowing northwards to the Waini and Barama, run to the S.; and, uniting with the Cuyuni, are conveyed to the Atlantic by the Essequibo.

From this ridge of hills the ground slopes southward to the banks of the Cuyuni; and I estimated the highest ridge which separates the two systems at 520 feet above the level of the sea. Heights which really deserve the name of mountains commence 20 miles further westward. The Aunama and Acarabisi are only divided from each other by hillocks which rise not more than from 60 to 100 feet above their level. Both rivers, if properly cleared of trees which have fallen across, would be navigable for canoes and punts; and as the portage is not more than 2 miles, these rivers present the means of connecting the Pomeroon and Morocco coast with the upper Cuyuni where the channel of that river is comparatively unobstructed. Towards evening we reached a Caribisi settlement, the latitude of which I found to be 7° 4′ N. It consisted of six houses, and seventy inhabitants. Its height above the level of the sea was ascertained, by Wollaston's barometric thermometer, to be 510 feet.

We followed the valley of the Acarabisi, by no means a comfortable path, as at this season of the year it formed an almost continued swamp, and we fell sometimes to our girths in the mud. A rich retentive soil renders these regions peculiarly fit for the cultivation of rice. It rained almost incessantly, and we were truly rejoiced when, on the morning of the 19th of July, we arrived at the Caribisi settlement Haiowa, about 2 miles distant from the left bank of the Cuyuni. The country between the Barama and the Cuyuni is a series of narrow valleys, situated between hillocks of no great height. The principal valleys are those which are drained by the rivers Aunama and Acarabisi. The general direction of the others is at an oblique angle to these,

and they vary considerably in extent. Sometimes they are merely defiles, and the greater number of them do not expand more than about a quarter of a mile. I am fully persuaded that there can be no soil better qualified for the cultivation of coffee than what is found here. The zones of granite, sometimes in spherical blocks, and the vitrified and ferruginous masses of clay which I frequently observed traversing the mountains, are favourable to the cultivation of that plant.

The productiveness of the soil nearer to the banks of the Cuyuni is evident from the specimens of sugar-cane, cotton, and plantains, which were brought to me while at Haiowa. I saw a cane measuring 15 feet long, and 7½ inches in circumference. The cotton, too, was of excellent quality and staple; and the few tobacco-plants which the Indians raised for their own use were remarkable for their large leaves, and, as I was assured, for their fine flavour.

Haiowa consists of four houses, which contain thirty-five inhabitants of the Caribisi nation. The Caribisi, like the Waikas, are a superior race. They are of a fairer complexion than the Warrans and Arawaaks, and their average height is 5 feet 5 inches. The female sex vie in symmetry of form with the men. Their features are more regular than those of other Indian tribes; and a profusion of hair, the tresses of which nearly touch the ground, contribute to their good appearance. Both sexes are great smokers: even children begin at an early age to indulge in that bad custom.

We expected to meet here a party which was to have been sent with a supply of provisions up the Cuyuni, for our stores had long since been given out, and we were reduced to cassava bread and what game chance brought to our hands. We were, however, disappointed in our expectations; and, in the absence of any craft, I had to send my coxswain a journey of 2 days higher up the Cuyuni, where I was told there was a corial large enough for our use. He arrived, and, having bargained for the corial, returned, with some additional guides, on the morning of the 22nd of July. We embarked our baggage, and a few hours later began the descent of the Cuyuni.

While at Haiowa I proceeded to the mouth of the Acarabisi, which bears from the settlement N. 75° W., distant about a mile and a half. Several meridian altitudes of stars gave me as mean result for the latitude of Haiowa 6° 56′ N. The boiling point of the barometric thermometer was $\frac{1}{47}$th of a degree higher than at Acarabisi, and $\frac{1}{50}$th of a degree lower than at the mouth of the Barima, which would give the approximate height of 260 feet above the level of the sea.

I attempted to repair the barometer, and made a number of

observations while at Haiowa; but until this instrument shall have been tested in George Town, it cannot be relied on. The mountains W. of the Acarabisi rise to a considerable height, and the summits of the Ekreku are estimated at 2000 feet above the level of the Cuyuni. Catiya, or Curumu, is about 20 miles to the westward of the Acarabisi.

The Cuyuni presented, where we embarked, a magnificent sheet of water. I estimated its width at from 400 to 500 yards. Its current was rapid—perhaps 3½ miles in an hour—and its bed full to overflowing. A small chain of hills, called Macapa, bore nearly W. They are distant about a mile.

Our progress was rapid, and in the afternoon we had safely passed the dangerous fall of Kanaima, and rested at an abandoned settlement on the river's right bank. There were some other settlements in the neighbourhood, the inhabitants of which came to visit us. We did not observe any mora-trees along the banks; they were replaced by another equally majestic tree which the Indians called Tá-au. The islands with which the river was studded were almost covered with bushes of the *Quassia-amara* or bitter ash. The stream itself continued as if cut up by a multitude of large channels, which are not seen from each other, thickly-wooded islands intervening; and no accurate idea can be formed of their total breadth: sometimes a little range of densely-wooded hillocks approached the water's edge.

We generally found that, in the morning at sunrise, a strong breeze set in against the current, and that it changed by degrees to E.S.E. or E. by S. Descending at the rate of 5 miles an hour, we passed numerous rapids; where the river was free from impediments, it was about 600 yards wide.

We passed the Otomong hills, and avoided by narrow passages between islands numerous large cataracts, which in our small canoes it would have been dangerous to attempt to descend. At the cataract of Poinka-marka, or Womuipong of the Caribisi, we had to unload and draw the canoes over a portage of about 300 yards' extent. The perpendicular fall of this cataract is not less than 30 feet, and it is generally called the *Canoe-Wrecker*, in consequence of many fatal accidents which have occurred here. We halted in the evening at six o'clock at a single hut inhabited by a Waika, his wife, child, and a dog. He shared his hut with us, although we were rather a numerous party for a single house. At a short distance hence the rivulet Arakuna enters the Cuyuni. Its banks are inhabited by a few Waikas; and a path leads from it to the river Puruni, which flows into the Mazaruni. The latitude of the hut is 6° 46′ N.

The rapids and falls now became less frequent, and still-water commenced. The tract of granite and gniess, which causes these

impediments, extends therefore from the Arakuna hills, uninterrupted, to the small range of hillocks called Macapa. It is about 50 to 60 miles in length, and constitutes the second large series of falls. About 8 miles below Arakuna, and opposite some small hills which rise on the river's right bank, is the island Tokoro (Tokoro-Patti). A little below Tokoro-Patti, on the left bank of the Cuyuni, is the rivulet Iroma. The rivers Rupa and Appa join the Cuyuni from the N.; they were the largest tributaries we had met in the course of our descent. We reached in the afternoon the Toraparu, a rivulet from whence a much-frequented path leads in a day to the Paruni.

We had anxiously looked forward to meet the party which we expected with supplies of provisions. We heard of them to-day at a settlement opposite the Toro-hills, but only to have the disappointment of learning, that on ascending the previous day the dangerous fall Wakupang, they had lost everything, and saved only their lives and the corial. Among the luggage lost was one of the instruments, Massey's log, and a new tarpauling. Thus disappointed in our hopes of meeting comfort, we had to put up for some days longer with our scanty fare. We paid off our guides who had accompanied us from Haiowa, as, with the men who had come up from the Essequibo, our crew was sufficiently strong to reach that river.

The dangerous fall Wakupang, where our stores were lost on the preceding day, was passed without accident. This is the commencement of the second series of rapids or falls. The river is studded with islands; green-heart and purple-heart, both most valuable trees, become abundant along its banks; but the impediments which the numerous rapids throw in the way will for some time render these treasures unavailable.

We passed in the afternoon the Cutuau hills, along which a river of the same name has its course. The Cutuau offers a communication with the river Waini, and is much frequented by the Indians of both rivers; 8 miles further eastward is the rivulet Wayarimpo, whence another path leads to the Paruni. The river is here free from impediments; its breadth from 600 to 700 yards; its water clear, and of a brownish colour. The circum-meridian altitudes of three northern stars gave me 6° 43′ N. as the latitude of this creek. A few miles from it is the cataract Tonomo, where the post-holder resided after his station had been withdrawn from Tokoro Island.

We had commenced this morning (July 26th) the descent of the third series of falls, caused by a small range of mountains through which the river has broken itself a passage. It rained almost incessantly; and, as the wind was against us, it endangered our descent of numerous rapids, and the coxswain could scarcely

look forward. We had to unload at the cataract Aruaka-Ematuba, and to haul our corials over land.

We passed soon after the Woka or Powis mountain, which rises, on the river's right bank, to a height of 500 to 600 feet. This ridge extends W.N.W. and E.S.E., and it can be seen from the junction of the Cuyuni and Mazaruni. Little islets, consisting of heaped-up masses of rock, divide the river into numerous channels. We had to pass the fall Camaria; and as it did not afford any portage, we attempted to descend it in our own crafts. It nearly proved our destruction: as it was, the craft filled with water; and it was only the presence of mind of some of our crew to which, under the Almighty, we were indebted for our safety.

We reached on that evening Ematuba, generally called "the Great Fall," where we had to unload and haul our corials over land, and encamped at the foot of the small island whither the corials had been drawn. Continued rains precluded the possibility of any observations, and we started on the morning of July 27th, under the same unfavourable weather. An hour and a half after, we were at the foot of the last fall, called Akayu, and saw before us the junction of the three rivers, Essequibo, Mazaruni, and Cuyuni.

We were received with demonstrations of hearty joy by the remainder of our party, who had awaited us at the Protestant Mission at Bartika Grove, near the junction of the Mazaruni and Essequibo; and the missionary, the Rev. J. H. Beman, joined in their welcome.

Our party left Bartika Grove on the 28th of July in two corials, and we arrived safely in George Town on the second day ensuing, after an absence of three months and a half, during which period we had travelled upwards of 700 miles; and although that period presented but a continuation of the most unfavourable weather, we nevertheless determined *twenty-one* points astronomically, and acquired a correct knowledge of the course of the rivers Waini, Barima, Amacura, Barama, and Cuyuni, all of which had never been visited before by any person competent to delineate them in a map; no wonder therefore that their actual course should be almost opposite to what it is represented in extant maps.

The fertility of the tract we have explored has been pointed out in various places in this as well as my former account. The lands adjacent to the rivers Amacura, Barima, and Barama, and beyond the reach of the tides, are superior in quality to those of any other district hitherto visited; and this refers equally to the Cuyuni, where I met sugar-canes of the finest description, and native cottons of superior staple and quality. But the obstacles

which impede the navigation of the Cuyuni will, I fear, prove a great obstacle in the way of rendering the fertility of its banks available. The Amacura, Barima, and Waini are for a great distance free from such impediments; and a denser population only is wanted to render this part of Guiana one of the most productive throughout its whole extent; and to this end the numerous natural canals and connexions between its chief rivers would materially contribute.

These tracts are at present inhabited by the following tribes:— 1. Warrans, along the coast, from Pomeroon to the Amacura; 2. Arawaaks, intermixed with the former, chiefly at the rivers Waini, Barima, and Amacura; 3. Waikas and Chaymas, sister tribes of the Wacawais, at the upper course of these rivers, and the regions between the Barama and Cuyuni. I estimate the whole number of these nations at 2500. Many of them assist in felling timber or in working on the estates; and if the system which only of late years has been followed, namely, that of treating the Indian as a rational being, in giving him a fair remuneration for his work, shall be generally adopted, the aborigines, there is no doubt, will prove most useful labourers to the colony. It is my full persuasion that if the attention and paternal provisions which the aborigines of Guiana have of late years enjoyed at the hands of Her Majesty's Government be continued, and means adopted to afford them religious instruction, a relic of the once numerous Indian population may yet be rescued.

V.—*Cape Palmas and the Mena, or Kroomen.* Communicated by Dr. Francis Bacon.

The region around Cape Palmas, comprising parts of the Grain and Ivory Coasts of West Africa—extending, along the coast, from Little Kroo (about 100 miles N.W. of Cape Palmas) to Tahou (about 100 miles E. of Cape Palmas), and averaging probably 100 miles in breadth towards the interior—is, not only in climate, soil, and productions, but in geological, and geographical, and ethnographical characteristics, *one country*. Its general position is remarkable and interesting, occupying as it does the grand salient angle of the western shore of the continent, which here changes its general direction from N. and S. to E. and W.; Cape Palmas itself being the actual turning point, as it is the centre of that sector of a circle which very nearly encloses the region under consideration. This point is also the *centre* of the subject in another sense; for, residing there at different periods in the course

of more than two years (about nine months in all), it was there I began my researches, and thence I gradually extended them in every direction until they embraced, directly or indirectly, most of the country, the description of which is here attempted.

The whole country, though by no means level, presents nothing that can be called a mountain to the eye of a voyager along the coast; though, in the haze of the dry season, the little hills of Cape Palmas (perhaps from 50 to 200 feet high) often "*loom* up" in the view from the sea, so as to half-justify the otherwise unaccountable fictions of some transient observers, who have assured their readers of the existence of mountains there which Golbery and others have rather hastily pronounced to be the westernmost termination of the "Mountains of the Moon."

In the short excursions made by me towards the interior from Cape Palmas, the land, like all other lands, gradually became more elevated; yet, for 50 miles, the highest eminences are only hills of moderate elevation: but, from the low tops of these, looking N. and N.E., I could perceive, over a more broken country, high blue peaks and ridges towering in the horizon, which seemed well entitled to the name of mountains. I know them to be such from the testimony of those who have actually ascended them, and passed over them to others beyond, still loftier; from which again the view towards the interior presents a constantly ascending series of mountainous elevations. With these observations, testimonies of the routes from other points of this coast towards the interior uniformly coincide; so that I am warranted in making the general positive statement that this whole region lies upon the southerly and south-westerly slope of an interior mass or group of mountains, whose ranges probably conform to the angular direction of the sea-coast in this part, or perhaps rather are themselves the basis and skeleton which gave the coast this outline. The position of this group, it may be remarked, is not remote from that announced, by Park and other travellers in Senegambia, as extending far to the southward of that region, under the name of the "Mountains of Kong."

This simple view of the orography of the country further illustrates the next important physical feature—the course of the rivers. These are all short and insignificant, rising within the limits mentioned, and, as far as known, running a nearly straight course—the general direction being at right angles to the coast until within a few miles, or a single mile, of the sea, when they all make an abrupt turn and run for some distance parallel with the coast, or nearly so, and then, spreading into a wide basin and dividing into a labyrinth of mangrove-creeks, they pour their waters into the sea through narrow embouchures, in which the surf is dreadful beyond description, and in most of them always

totally impassable. Not one of these rivers is navigable: the largest of them might admit the passage of a ship's long-boat for 20 or 30 miles, if the bars at their mouths were safely crossed; but most of them are so shallow, or so obstructed by rocks, that hardly anything but the light canoes of the natives could find sufficient depth of water. The number of streams discharging their waters into the sea on this tract of coast is about 12, which need not be here enumerated, as the charts of the new surveys of the coast by H. B. M. ship Ætna will give all such details. The largest of them is the Cavally, which enters the sea about 18 miles E. of Cape Palmas: a brief description of this may serve, in its general characteristics, for all. It rises about 80 or 100 miles from the sea, in the mountains of the interior group before alluded to: its general course is very nearly S., though the course of its primary branch is nearly S.W. till, augmented by some westerly streams, it turns more southerly, through a narrow valley between two low ridges, which are (as far as I have ascertained) trap, or syenite, and red sandstone, the latter much vesiculated on its surface and in its places of contact with the former. At the distance of about 60 miles from its mouth occurs a transverse ridge or bed of rocks, over which it pours in a slight cataract, known by the name of the "Falls of the Cavally." Thence it continues, with several bends, alternately south-easterly and south-westerly, through a very populous and fertile region, to a point not more than 3 miles from the sea, whence it turns about, E. by S. or E.S.E., and runs nearly parallel to the coast for nearly 6 miles, leaving between it and the ocean a somewhat triangular tract of level or slightly undulating sandy alluvial. It then sends off numerous lateral branches, which reunite and form alluvial muddy islands, densely covered with mangroves, that line the banks with an impenetrable dark fence, cutting off all view of the land by the density not only of their foliage, but of their interweaving trunks, projecting roots, and rooting branches—characteristics of this singular tree too well known to need further description, but noticeable as giving one uniform sombre air to all the river scenery of the coast of intertropical Africa. The whole mass of its waters finally widens into a large basin, about a mile broad, from which it breaks furiously into the ocean through a shifting passage in the sandy beach not more than 100 yards wide. On the bar, where the torrent meets the tremendous waves of the roughest of all seas in the world, the "*rollers*" rise and sharpen into high breakers, which are for ever roaring and foaming across the channel in a continuous line, constituting a barrier of surf which has never yet been passed. This is the general character of all the river-mouths of this region, and, in fact, of the whole coast from Cape St. Ann to Cape Formoso; yet rather less than

one half of them may be passed at favourable times by the exercise of great prudence and energy, waiting for an interval of comparatively moderate surf, and then hurrying through the dangerous pass with all possible speed, before the closely pursuing succession of heavy swells overtake and overwhelm the unfortunate boat, to the almost certain destruction of all in her. In spite of all these precautions, however, and the remarkable skill and energy of the native boatmen, fatal accidents of this kind are of frequent occurrence.

The outline of the sea-shore is very irregular, the sandy beach being at intervals of about 5 or 6 miles broken by sharp rocky points, prolonged occasionally into long reefs, partially visible above water, which constitute the most formidable among the peculiar perils which the navigator encounters along this fatal coast. Notwithstanding this general conformation of points and bights, there is not one bay or harbour, or even roadstead, offering the least shelter to vessels. This remark may also be extended to the whole coast of Western Guinea, from Cape St. Ann to Cape Formoso. Vessels always anchor in the open sea, at from 1 to 5 miles distance from land, after carefully ascertaining the quality of the bottom by repeated soundings, generally in from 5 to 25 fathoms. The surf on the beach is everywhere formidable, like that on the river-bars, but the danger to life is comparatively trifling, for though a "*capsize*" is an every-day occurrence, it is seldom difficult to scramble out upon the beach with no worse injury than a complete immersion in sea-water of the comfortable warmth of 86° Fahrenheit. The landing is almost always effected in the light and ingeniously constructed canoes of the natives, as there are few places where a boat would not be stove by the surf. Gales of wind are almost unknown on this coast, though short furious tornadoes are frequent throughout the year, most common, however, in the spring and autumn.

The rocks of this region are of but two species, as far as I have seen them. 1. A light-red sandstone, apparently the general stratified foundation of the whole soil, and, in many places, evidently the material of which the loose soil is composed: it is a small-grained conglomerate, mostly of quartz fragments—coloured, of course, by the sesquoxyd of iron. On the low ridges which vary the surface of the country we find it apparently much thrown out of place, broken, and altered in its mechanical characteristics by proximity to another formation which here intrudes. 2. A diabase, varying in different localities in the degree to which its two components are blended or separated—in some places being a coarse syenite, with large distinct masses of hornblende and feldspar; in others a fine syenite, the dark surface being minutely speckled with the white feldspar; in others, approaching to trap

or greenstone in the intimate union of its parts with the bluish-black hue, rusted brownish yellow on the long-exposed surfaces; and in others, losing in a great degree the feldspar, it presents a nearly pure hornblende schist. In most places it inclines to a distinctly schistous structure, whatever may be its mineralogical character; and it is also, with general uniformity, traversed by veins or beds of white quartz, varying from an inch to a foot in thickness. The direction of the schist is nearly due E. and W., with great uniformity. The great strata, or rather laminæ, are for the most part nearly at right angles to the horizon; but there is, I think, generally a slight dip towards the south. This rock forms the points, reefs, and islets of the whole coast. In the Kroo country (the north-western portion of the region under consideration) it is of the first-named variety, and even in spots granitoid in character, having occasional specks of black mica and patches of white and reddish quartz. As we proceed down the coast it becomes more like greenstone in its characters. At Grand Sesters and Garraway it is the hornblende syenite; at Fish Town and Cape Palmas it is almost greenstone; and at the latter place there is much of the hornblende slate, in which iron pyrites frequently occurs. Eastward of Cape Palmas it continues of this general character. Towards the interior the diabase more rarely appears: instead of the rough and sharp masses of black rock which project in little precipices along the points of the coast, we there find even the loftier eminences more rounded in their outline, richly wooded or cultivated to the very top, and seldom showing the rock on the surface. This, however, occasionally displays itself in the deeply-worn paths of the steeper ascents, and in the course of the mountain-torrents, which in the rains make slight sections of the soil and lay bare the red sandstone. The appearance of these elevations suggests the idea that the force which raised the apparently igneous rocks, and thrust them through the broken strata of the sandstone on the coast—in dikes, peaks, ridges, and the usual forms of trap intrusions—had in the interior met greater resistance in the superficial strata, and consequently only bent and raised them into higher elevations, without piercing and surmounting them, in most instances. I never discovered any organic remains, or gypsum, or saline formations, or coal deposits, or any calcareous substances, in this red sandstone; nor, indeed, anywhere on the whole coast of Senegambia and Guinea from the Senegal to the Gold Coast. No gold occurs, or is suspected to exist, in that region which I am now describing, unless the iron pyrites of Cape Palmas be auriferous.

The soil of the whole country is sandy and dry, and would be unproductive but for the peculiar character of the climate, and of the agriculture of the very industrious native inhabitants. In

natural fertility it is vastly inferior to Senegambia and the region N. and N.W. of the Grain Coast. The climate, however, is so modified as to regulate the heat and moisture very happily to the exigencies of the soil. The rains are more equally diffused throughout the year than in the higher intertropical latitudes, beginning before the vernal equinox, and continuing long after the autumnal: what is called the "dry season," in fact, commonly includes less than three months in December, January, and February; and even then heavy showers are by no means uncommon—in some years rain occurring in every month: a state of things strikingly different from the seven, eight, and nine months absolute drought so constant and regular in Senegambia and the adjacent coast. One such season, apparently, would make the whole region around Cape Palmas almost a desert. The ground, thus well watered under a heat seldom less than 80° (Fahr.) even in the most sterile portions, constantly sends up a thick growth of shrubs; and, if neglected for a long course of years, becomes covered with immense trees, the loftiest in the world—in comparison with which the "tall ancestral trees" and "patrician oaks" of old England seem but "plebeian underwood." The largest and loftiest is the cotton-tree—either *Bombax ceiba*, or a closely allied congener. The mighty *Adansonia digitata*, the monarch of the vegetable kingdom, seems peculiar to Senegambia and its vicinity; at least I could never discover or hear of it farther S. than Cape Shilling, the southernmost point of the peninsula of Sierra Leone. The *Bombax*, however, though much less in circumference than this kindred genus, is commonly more than twice its height—often attaining an altitude (if I may be allowed a bold *guess*) of 200 feet; and all along the low coast constituting, with few exceptions, the only landmarks to direct the distant voyager—their huge tops appearing, many miles out at sea, like sails on the horizon; while the land, whose proximity would not otherwise be suspected, is totally invisible. In the little patches of forest which exist, other very large and lofty trees occur, of much harder and more durable wood than the *Bombaceæ*, equal in weight and firmness to teak, and almost to mahogany. Some of these are too hard and heavy for the natives to fell and work; but all that are manageable are of great value to these industrious people for the construction of large canoes, some of which, dug out of a single trunk, will carry more bulk than a common ship's long-boat, and can take in two large puncheons side by side.

But few and small tracts of such forest, however, are permitted to exist. Fully nine-tenths of the practicable soil are under alternate cultivation. The poverty of the soil is such as to require the mode which the natives universally adopt for obtaining a crop from it. The fields which are cultivated this year are suffered

to lie totally uncultivated for three years following: others are cleared and tilled to supply their place, changing the ground from year to year. By the fourth year the fallow is covered with a thick growth of bushes and small trees, which are then cut down, and the lighter branches burned on the spot, their ashes forming, with the decayed vegetable matter which has accumulated in three years, a thin soil sufficiently rich to furnish, by careful cultivation, with the aid of the abundant heat and moisture, a sufficient crop of rice or cassada, which are the two principal and almost sole products. The time of clearing and planting is from the 1st of January to the 1st of April. The rice-harvest commonly begins in August, and ends in October. The peculiarity of the seasons here, furnishing an abundance of moisture throughout the greater part of the year, gives this country very eminent advantages for the production of rice; which, as is well known, in almost every other part of the world—as in Carolina, India, China, &c.—is confined to low grounds, liable to regular inundation. This is also the case with the northern part of the rice-growing region of W. Africa, from the Gambia to Sierra Leone, or Sherbro, where the culture of this great staple is never attempted, except in the low grounds, and mostly along the banks of streams. But, on the Grain and Ivory Coasts, the long and abundant rains furnish a bountiful supply of water to the whole surface, high and low; so that the traveller meets with luxuriant rice-plantations on the sandy plains, and even on the sides and summits of the highest hills. The rice-growing region ends, on the coast, about St. Andrew's Bay, near the eastern limit of the Ivory Coast. Along the Gold Coast the culture of rice is hardly attempted, from the comparative dryness of the climate; for though the *period* of the rainy season is about the same as that of the western region in the same latitude, yet the showers are light and short, generally coming in furious squalls from the S.E. This peculiarity of climate, however, has its own advantages, like that of the W. coast, for the Indian corn or maize, which can hardly be ripened in a wet climate, is found to flourish and produce richly on that dry hot soil, and has become an important export from Africa, even to America, which hitherto has been supposed unrivalled in its capability of producing this its *indigenous* grain. This important addition to its produce the Gold Coast owes to the influence of British colonial government. It was first introduced, about 20 years since, by a British governor, whose name I cannot at this moment recall. On the windward coast it is occasionally raised in a small way, but is plucked while green, as the wet weather would seldom permit it to ripen. How it would succeed in the drier regions of Senegambia, I know not; for there again the soil (N. of the Gambia), incapable of producing rice, rejoices in

its own peculiar grain, the Guinea corn (a *Holcus*, I think), which excludes all the other *Cerealia*, from the Gambia to Mount Atlas. The Jaloffs and the Moors prefer it to rice and all other grain. These circumstances make the Cape Palmas region, notwithstanding its naturally poor soil, the granary of W. Africa. It is customary for British vessels, bound to the Bight of Biafra for palm-oil, to stop at some place on this part of the coast to supply themselves with kroomen (native boatmen), and rice for their support during the voyage, as none can be obtained to the leeward. The slave-traders, also, on the whole coast from the Rio Grande to the equator, have drawn their principal supplies for the sustenance of their live cargoes from this same region.

But in a commercial point of view, the most important article yielded by the country is derived not from agriculture, but from the fruit of a spontaneous production of the soil. This is the Elaïs Guineënsis,* from the covering of whose seed or nut is extracted the palm-oil, so well known and important in English commerce and manufactures, some hundred thousand tons being annually imported into Liverpool, London, and Bristol from West Africa—the great majority, however, into the first-mentioned city. The Grain and Ivory coasts, indeed, compared with the Gold-coast and the Bights of Benin and Biafra, are but poor in palm-oil, yet they furnish enough to bring about half-a-dozen regularly trading English vessels to this region every year, besides the same number of Americans, and nearly as many Frenchmen, and in addition numerous occasional traders.

The palm-oil-tree is indigenous and abundant from the Gambia to the Congo; but the oil is manufactured in large quantities only in about two-thirds of this extent of country—the Rio Nunez being the most northern place whence it is exported (though in very trifling quantities), and the Bight of Pannavia being the southern limit of its production. Africa does not present the botanist with many species of the splendid tropical order *Palmæ*. On the western coast I have never seen but four which are indigenous; and of these, one, the *Phœnix dactylifera*, is confined to the neighbourhood of the Senegal—being properly a plant of the northern half of the continent, or rather of that peculiar region of deserts, mountains, and oases that stretches from the Atlantic to the Persian Gulf, with the same general characters. It is the land of the date and the gum, of the camel and the ostrich, of the Berber and the Arab, of the Caucasian race and *not* of the negro. This region, except in the bare circumstance of juxta-position or continental unity, has no more affinity or connexion with Negro-Africa in climate, soil, products, inhabitants,

* Smith and R. Brown, Congo Exped.

diseases, or history than it has with India, Oceania, or South America. In the neighbourhood of the Senegal, which is on the line of these grand divisions, the date-tree is perhaps not strictly indigenous, as it does not appear widely diffused over the country, but is mostly confined to the towns and the vicinity of houses, where it thrives, and is much valued. The Arabs may have brought it thither from the desert. Along the sandy plains and rocky points of the sea-shore, on the Grain and Ivory coast, there is indeed a dwarf date, the *Phœnix spinosa* of Thonning and Von Martius. Its distinguishing characteristics are its minuteness, and its total want of trunk or stem—the leaves being all radical, springing from the ground and gracefully arching over backwards, so as to touch it again with their other extremity. The leaflets, like those of the *P. dactylifera,* are stiff and sharp as daggers, so that wherever this plant invades a tract of land it soon becomes impenetrable to man and beast. Not even the sturdy bullocks can pass through it to graze, its sharp points easily penetrating their tough hides, though it never rises more than 3 feet from the ground. Its fruit, not bigger than a large currant, is also a perfect date in miniature. It is often eaten; but the bulbs, or rather underground parts of the leaf-stalks, are most valued, as when boiled they furnish a very palatable dish, of the consistency of cabbage, of a very rich and nutritious taste; and thence the plant is commonly known at Cape Palmas as the "palm-cabbage." Von Martius confines it to the Cape Verde islands and the coast from Cape Verde to Sierra Leone. My observations extend its *habitat* to the E. termination of the Ivory-coast. The only other indigenous palm on this part of the coast is the *Borassus Æthiopum* of Von Martius, which I believe is nearly co-extensive with the *Elaïs.* It is a stately and beautiful tree, sometimes occupying long tracts upon the sea-shore for miles together, not densely like a wood or grove, but with interspaces of 2 or 3 rods, quite clear of underwood, and often covered with a smooth green sod, mounded at regular intervals by the indefatigable *termites,* whose works here almost equal those of man. This is the character of the vegetation of a tract of coast from 12 to 6 miles northerly of Cape Palmas; and this immense group of tall *Borassi,* being, in the view far out at sea in a vessel coming from the N.W., blended with the obscure outline of the low rocky point 7 miles beyond it (which is the veritable cape, though it shows no palm-trees, and probably never did), suggests the true occasion of the name applied by the Portuguese discoverers—*Cabo das Palmas*—"the Cape of the Palm-trees."

The *Cocos nucifera* makes its appearance at several places on the coast which have had much foreign commerce; and on the Gold-coast almost every town is shaded by a large grove of them;

yet it has evidently been introduced by Europeans either from the East or West Indies—more probably the latter.

The country, thus hastily described, is very densely inhabited by a peculiar, energetic, enterprising, and interesting people, the *Mena* race, generally known on the coast under the names of Kroomen and Fishmen. As temporary emigrants or rather *journeymen* labourers, the young men are found at every trading-place on the coast from the Gambia to the equator, or beyond, and on board of every vessel, whether merchant or man-of-war. At home or abroad, they are characterised by great industry, patience, intelligence, fidelity, and obedience. The short account of the Kroomen in Messrs. Laird and Oldfield's journal of their voyage to the Niger, contains, as might be expected from their transient opportunity of observation, many errors. About one half is, however, quite true; but the other half is so incorrect as to give a very unjust idea of the character and situation of these remarkable people. For instance, no man that has ever lived among them in their own country could tolerate the statement that a Krooman or Fishman having acquired money abroad lives in idleness at home supported by the labour of his wives. They continue, with hardly the exception of the highest chiefs, a most laborious race until about the age of forty-five or fifty. The women are restricted to particular kinds of labour, household affairs, planting and gathering rice. But the cutting and clearing of the bush, the building and repairing of houses and canoes, the manufacture of utensils, &c., fishing, and a long list of laborious employments keep the men as active and industrious as the women. A more universally industrious people I do not know in the world, civilized or uncivilized. The political constitution of the Mena is very purely republican, the sovereignty of the different communities being generally exercised by four elective chiefs of different functions, constantly checked and liable to removal by the popular will. Their religion is practically a mere *fetichism*, with some obscure traces of a speculative belief in one great sole Deity, and a few other partially correct notions of natural religion. Their language is throughout the whole country fundamentally the same; but they are divided into about twenty tribes speaking as many different dialects, about as unlike each other as are the different provincial forms of the Spanish or the German—individuals of the more widely-separated tribes being only able to understand each other on the commonest subjects, while bordering tribes can converse with each other with nearly as great facility as the inhabitants of neighbouring counties in England. In language, as in manners, usages, character, and physical appearance, this whole race is very widely different from all other African nations, far and

near, scarcely any affinities being traceable between them and the Búsús, who border them on the windward side, nor with the Búgerè on the leeward—and not the least with the mysterious Bá-ú-rĕ, who occupy the vast unexplored interior behind all these coast-tribes.

The Grebo language, which is the dialect of the tribe of the Mena residing in the immediate vicinity, is spoken by about 24.000 persons, inhabiting from about 10 miles N.W. of Cape Palmas to the Cavally river on the E., occupying a territory of about 100 square miles. Being thus situated nearly at the centre of the Mena region, their language is about midway in character between the dialects of the E., W., and N. extremities of the whole region, and is therefore very happily adapted to become the standard written language of the race. A number of little books in this tongue have been printed at Cape Palmas. They are the work of the Rev. John Leighton Wilson of South Carolina, missionary of the American Board of Commissioners for Foreign Missions. He first established himself at Cape Palmas December 25th, 1834. In the course of five years, among many arduous duties, and, for the first two years, suffering much from the diseases of the climate, he grammatized the language, so as to make it a perfect vehicle of religious truth to the people, numbers of whom are now fast learning to read and write their own language in the schools of the mission. Thirty or forty were in 1839 fluent scholars, so as to find much pleasure in reading each little book as it appears from the press; and a few already acting as teachers of schools, one of which is planted at Sórrakè, in the Guábo tribe (behind the Grebo), about 30 miles N. of Cape Palmas.

I must ask indulgence for the deficiencies and incompleteness of this sketch, trusting that it may interest by the facts it contains, relative to a dangerous and unexplored region, which deserves the scientific labours of men better qualified and provided for observation and exploration than I was. I have written by snatches in the brief intervals of a hurried visit to England; and this circumstance, together with the confused feeling consequent upon a return to the bustle of civilized life, after three years of semi-barbarism, are unfavourable to the satisfactory execution of what I have attempted.

VI.—*Notes of a Tour in Armenia in* 1837. By K. E. Abbott, Esq.

I had resided for nearly two years at Erzerum, in Armenia, when I quitted that city on my way to Persia—not taking, however, the direct road, but one which should lead me into it by Kars, Gumri, Anni, and Kurghesman. The following is an itinerary of that part of my journey only.

Saturday the 13th May, 1837, found me and my party mounted. I had engaged seven horses for myself, a cavas or guard, a servant, two loads, and two surijis or postillions; and, starting from Erzerum at one P.M., took the road to Hintz, leading at the foot of the hills on the eastern extremity of the plain. We passed successively the villages Muduighère (near which, on the hill-side, is an Armenian monastery of the same name), Tasmaczor, and Keussé Mehmet. Close to the last mentioned is a pool of very cold water, which bubbles up with considerable force; its depth is said to be great, and the taste of its waters unpleasant; the natives have a notion that it contains a marine monster, hence its appellation of Aígher Gol. Passing this, our road soon became extremely bad, and the rain fell in torrents until we reached the village of Hintz, situated at 3 hours from Erzerum. I did not halt here, but, quitting the village, crossed some low hills behind it, and entered a small valley through which flows the rapid but, at this part, insignificant stream of the Euphrates, which we presently crossed by a stone bridge of one arch, after passing the little village of Tafta at 5 min. to 5 P.M. Our path led us up the side of the valley, and near the village Sclaweck, where we quitted the course of the stream, which wound through the hills on our right. Our direction had been N.N.E. up this valley. At ½-past 5 we again crossed the Euphrates' stream, and alighted at the village of Ghirreh Khusak, which contains ten or twelve Turkish families, and is situated at the head of another valley running N. and S., and having the above-mentioned stream gushing in a torrent down its steep descent. The source is at Domlú, about 2 hours off, where a small basin has been constructed. The stream in its way down the hills is fed by numerous little springs, and before it reaches the western extremity of the plain of Erzerum it attains the width of about 30 paces.

May 14*th*.—We left Ghirreh Khusak this morning at about 7 o'clock, and immediately ascended the hills behind the village. Passing through a narrow chasm at 10 min. past 7, our road led us in a north-easterly direction towards a broad valley, in which is situated the nearly deserted village of Kara Ghubeg, whose Armenian population retired with the Russian army at the conclusion of the last war: their habitations are now in ruins: a few Turkish

families alone remain. A lofty mountain rises immediately on the N. of this village, from which it derives its name. Our general bearing up this valley was N.E. till 25 min. past 8 A.M., when we turned off to E.N.E., and struck up the side of the hills, passing immediately afterwards a village on our left, and gradually taking a more northerly direction up the ascent. The high range of mountains called the Kerechli Tag were in our front, running N.W. to S.E., as well as I could judge. Our road led us over a stony country, almost unfit for cultivation, of which indeed none was visible, except immediately around the few villages we passed, and that evidently at the expense of great labour. Our direction once more leaned to the E. till we reached the village of Barr at ½-past 9 A.M. The ruined appearance of the place announced that it likewise had been deserted by its Armenian population: a few Turks are now its only inhabitants. Without halting here, we continued the ascent in a general direction N.E. till ½-past 10 A.M., when our path led us into a deep valley at the foot of the Kerechli mountains. We commenced the ascent at 10 min. to 11, our path leading us N. by E. till 12 o'clock, when it altered to E.N.E., and became extremely steep. The mountains here produce a few firs and shrubs of stunted growth. At 12 min. past 12, having reached the highest part of our road, I looked at my barometer, which marked 22·2; centigrade therm. A. 9½, D. 10: this would make the elevation above the sea about 800 feet. Our road, however, did not by any means lead us over the highest part of this range—a neighbouring mountain on our left reared its summit far above us. The descent was long, and finally brought us into a valley, having a small stream through it, the windings of which we followed in a general direction of E. by N. This valley is, as will be seen, of great length; its sides are thinly clothed with low shrubs, and as you descend to the village of Itt, its width increases considerably. We passed only one village before reaching Itt, which is situated nearly at the extremity of the valley, and which we entered at 10 min. to 4 P.M. In and about this place I observed large rough blocks of white marble of a coarse description appearing above the surface of the ground. It does not appear that any search has ever been made here for a better quality of marble beneath the surface; in fact, it could be of little use were it discovered in such a situation.

Itt is a village of about 50 houses, occupied by Turks; the few Armenians that were here emigrated with the Russians, though the latter did not pass immediately through this part of the country.

15*th.*—We started again at 10 min. to 7 A.M. with excellent horses, and were soon at the end of the valley A high range of

hills, called the Karkapasari Tag, runs nearly at right angles with the Itt valley, and a shallow stream, which is increased by the junction of the one the course of which to Itt we had yesterday followed, flows at its foot through another valley, along which we proceeded in a N.N.E. direction at a quick pace. We forded the stream twice in its windings, and at 20 min. past 8 passing it by a bridge, we soon after quitted it on our left, and proceeded N.E. by E. down the valley. The river flows to Nerman, a large village, near which we passed at 9 A.M. This place is at 2½ hours from Itt; the stream then flows to Altu 2½ hours further. At ½-past 9 we entered a narrow ravine, winding E. and N.E., and presently ascended the hills by a path leading S.E. at first, afterwards N.N.E., and lastly S.S.E., near the village Teghdeh, until we attained the highest part of the road at ¼ to 12. My barometer here showed 22·62; centigrade therm. A. 5·3, D. 4·5, in an observation taken during a heavy hail-storm. The sides of the hills we had just ascended were pleasingly varied with low shrubs and trees, whilst at the summit fir and pine abounded, though I did not observe any trees of large girth. Timber of large size is procured a few hours off, in the Soghanli Tag, for the supply of the country below. Winding in an easterly direction down the hills, which abound also on this side with small firs and pines, at 12 o'clock we passed a collection of huts called Persún, and soon after the descent became so steep, as to oblige us to alight from our horses and walk down, during which we were overtaken by another hail-storm. At 10 min. to 1 P.M. we arrived at the Turkish village Taprak, situated on the side of the hill, and after refreshing our cattle until 2 P.M., continued the descent into a deep and narrow valley, having a torrent gushing with impetuosity through it, which at times scarce left room on either side for a path. Shrubs of various kinds, but especially the barberry, grew in profusion in this valley, many of them were in blossom, and wild flowers weie scattered along our path. The slope down the valley was very considerable; we reached its extremity at 3 P.M., and passing the stream by a wooden bridge, immediately ascended another, which ran at first S.S.W., and had also a torrent flowing through it, uniting with the one we had just quitted, and passing, I am told, to Tenak, a neighbouring cassaba, and thence to Ardahan. Our path up the valley obliged us to cross and recross the torrents three times by wooden bridges. As we advanced, it took a more southerly direction. It abounds, like the one we had just quitted, with bushes and trees, and is cultivated wherever there is any clear ground, though I saw no habitations in it. At 10 min. to 5 P.M. we reached its extremity, which is abruptly formed by the Chakker Baba hills, running at right angles with it, which obliged us to turn E. up another valley,

still ascending the torrent. At ¼-past 5 we wound up the side of the hill S.E., and presently alighted at Bardos, a cassaba curiously situated on and around a promontory, at the foot of which winds the stream. Its summit is crowned with a fort, now crumbling to pieces with age. The inhabitants are entirely Mohammedans, consisting of about 150 families, who have a bad reputation in the country.

16*th*.—We quitted Bardos this morning at ¼ to 7. Unable to procure a sufficient number of fresh horses, we were obliged to take on three of those we rode yesterday. Crossing the stream by a bridge our road led up the valley through which it flows from the eastward, and at 7h. 35m. A.M. we passed through the village of Ghoreshkeh, from which we proceeded N.E. by E. I presently afterwards had the mortification to discover that my watch having got out of order, could be of no further service on the journey, and having no other, I could make no very accurate estimate of distances for the remainder of the way. On our right we had the Soghanli mountains, which at this part have only a sprinkling of fir-trees; and on our left were barren hills. We presently ascended the former in a direction E.S.E., where we overtook a string of arabas (carts) toiling up the ascent, loaded with long wooden pails made in the villages below, and intended for sale at Kars. Our road led us over a part of the hills clothed with small pines and firs, and gaining the summit at no great height, we had a view of a great portion of the Soghanli range, which in some parts is densely clothed with firs. From this point we made a long and gradual descent in an E.N.E. direction towards the plain of Kars, a tract of immense extent, which having reached, we presently passed the village Chepak, reckoned to be distant 7 hours from Kars. The most remarkable feature about the plain on this side is the great scarcity of villages, and almost entire want of cultivation. Hands are wanting to render it productive of aught but pasturage, whilst the nature of the soil, and the abundance of water at the S. extremity of the plain, would seem to ensure to the cultivator the most abundant crops. Crossing in a direction N.E. by E. some low hills, we reached a village called Hoshapunah, 2 hours from Chepak. Here I obtained a view of the cone of Ararat, bearing S.E of us. Its base was screened from sight by intervening mountains, and as we approached Kars we gradually lost the view of the cone itself. Another hour's ride brought us to the village of Süutlú, situated on a rivulet which flows into the plain from the N. from a place in the mountains called Zileji. We passed near five or six villages more as we approached Kars, and reaching the river which flows through the latter place, and which is here about 25 paces wide, followed its course for ½ an hour before we entered

the town. The houses without the walls occupy both banks of the stream, which here flows in a wide but shallow bed, having two well-built bridges thrown across it. The citadel is on an elevated rock, separated from the mountains behind by a deep ravine, through which the river passes. The walls appear to have been constructed at different periods. A long inscription in Armenian, surmounted by a cross, may be seen on one part of them, and there are several others in Turkish characters over the gateway. I observed in another part the figures of two animals facing each other; one resembled a tiger, but the other was too much defaced to be pronounced upon. The place contains about 2000 families, of which but few are Christians; 700 nizams (regulars) and 300 sipahis (irregular horse) are the military force of this pashalik, though I understand the number of the latter is to be increased; they are all quartered in and about Kars. The Russians in the late war remained here nearly two years, having occupied the place several months before they marched to Erzerum. It held out against them seven days, which is rather surprising, considering the weakness of the fortifications and the want of a regular garrison; but the Russians appear to have been ill-provided with artillery, for their fire did no injury to the walls of the city, though they bear the marks of a few of the Russian shot. A respectable Turkish merchant with whom I lodged, spoke in terms of praise of the general conduct of the Russians during their occupation of this place.

Kars is the seat of a pasha of two tails, who usually receives his appointment direct from the Porte; he is independent of any other governor in matters connected with the civil administration of the affairs of his own pashalik, but the present governor of Erzerum, being a seraskier (commander-in-chief), has the control of all that relates to the military establishment.

The town of Kars, though small, has the appearance of being a very busy one. It is a place of transit for Georgian produce, and that of Erivan into Turkey, and of Turkish goods from Erzerum to the Russian possessions, consequently a great many strangers visit it. The trade, however, in European produce is of small importance, but there is a considerable mart here for the manufactures of Turkey, which are exchanged for the productions of the Russian provinces, or for those of the pashalik itself, which consist principally of wheat and barley in great quantities; both articles are usually exceedingly cheap and good.

19*th.*—I quitted Kars at about 8 o'clock this morning, and proceeded in an easterly direction along the plain. The Childir range bounds it on the N.E., running N.W. and S.E., and is not a very high one, though the snow still lay in large quantities on some parts. I was told that there are about 200 villages scattered

along these mountains on this side, which belongs to Turkey, whilst the opposite side is in possession of the Russians. The Kars river skirts the plain on the N. and N.E. side, and there crossing its eastern extremity mixes with the Arpa Chai, after which the united streams fall into the Arras some way to the eastward of Kurghesman. The part of the plain over which our road led us for the first few hours is barren and nearly deserted, in consequence of the scarcity of water. The few villages which are found on it are obliged to depend on the supply of water they may be able to collect when it rains. This was the case with one, and the only one, we passed in the space of 3 hours' journey from Kars; it is called Kilfoglu, and here I had an opportunity of examining a plough of a different and more complicated construction than any I had before seen in Turkey. It consisted of a very broad share of iron fixed to the body of the plough, which moved on one large and one small wheel, placed side by side, so that the whole machine reclined on the lesser wheel. It was guided, as usual, by one man, but twenty or more oxen are yoked to it two abreast. The ploughshare makes a furrow of considerable depth, and about 2 feet in width, and the work is performed with great despatch. The soil of this part of the plain was remarkably dark, and is said to be very rich and productive, notwithstanding the entire want of irrigation. I was told that wells have been sunk about 40 fathoms below the surface, and yet no water had been found. The high peaks of the Aléghez mountains near Erivan, which are covered with perpetual snow, bear S.E. of this village; to the E. are other high mountains, also within the Russian line. Quitting Kilfoglu, we passed at some little distance from it a deserted Armenian village, situated near some marshy ground; presently afterwards we had a view of Ararat, bearing S. of us, but its summit was enveloped in clouds. The mountains of Akalkelek were likewise visible to us at this point through an opening in the Childir range. At the 5th hour we reached two villages situated close together, called Paldervan and Krekdereh; both were half deserted and in ruins. At the 6th hour we forded the Kars river, which is here a considerable stream, flowing to the S., and immediately afterwards passed through Jamushli, a large village, containing a mixed population of Turks, Persians, and Armenians; it has in its centre a small stone tower, built, I was told, of materials brought from the ruins of Anni, and intended as a place of retreat and security against the attacks of Kurdish tribes, when they were in occupation of this part of the country. Leaving this, we soon after forded the Kara Khan, an insignificant stream, flowing by a village called Kizil Charchak, which we passed, and which is likewise inhabited by Turks, Persians, and Armenians, and possesses a stronghold like the former

one. Many other villages near this are provided with similar edifices. We observed those of Ergheneh, Uzun, Klissia, and Tikness Kalessi, near the road; besides two or three others, the names of which I did not ascertain. The land around was highly cultivated, but the crops had as yet attained but small growth. We had quitted in this part the level ground, and got amongst small hillocks and undulating lands, and at about ½-past 5 in the evening reached Malamosa, a large and apparently flourishing Persian village, situated at the foot of a low hill, which we crossed, and reached at about 6 o'clock an Armenian village called Ajak Kuli, containing about twelve houses, which are situated near the bank of the Arpa Chai, immediately opposite to Gumri. This village was only recently formed; its inhabitants stated that they had quitted the pashalik of Mush to escape from the persecutions of the Kurds, and had settled down here last year only, having been obliged to erect for themselves the habitations which now compose the village. Their intention, they said, was to have followed in the steps of others of their countrymen, who, for similar reasons, have emigrated from Turkey to the Russian possessions; but, arriving at Gumri, they were refused admittance, on the plea of there being no accommodation for so many in the quarantine, but they were recommended to settle down on this side of the river. They appeared well contented with their situation. It is singular, if true, that the Russians should have opposed the settlement of these emigrants within their boundary, after the pains they have long been at to populate their own provinces at the expense of Turkey.

We took up our quarters for the night in the corner of a filthy stable, full of cows, calves, and buffaloes, which rendered the atmosphere so heated and disagreeable that I was glad to make my escape into the chill air in the middle of the night, when, wrapping myself in my cloak, I fell into a good slumber, undisturbed by anything except the occasional cry of the Russian sentinels on duty at the fort. On the following morning I walked up some low hills immediately behind the village, to endeavour to obtain a view of the Russian works, but the distance prevented my seeing anything distinctly with the naked eye, and I had no glass with me. The space marked out for the fort occupies two ridges running parallel to each other and to the Arpa Chai, from which latter I should have judged them to be distant about half a mile, but I have since been told that it is considerably more than this: I estimated the length of the ground-plan at about a quarter of a mile, and was told that the breadth did not exceed half the length. The villagers were totally ignorant of what was going forward on the opposite side of the river, and could give me no information of any kind respecting the fort; it was evident, however, that but

little progress had been made with it beyond the foundations: a large round tower has been constructed on the southern side, which I am told is of great strength. The town of Gumri is situated below the place marked out for the fort on the eastern side, and is not seen from Ajak Kuli: beyond it is a considerable tract of plain country bounded by a range of mountains.

20th.—We quitted the village at about seven in the morning, our road leading us southward along the banks of the Arpa Chai. On the opposite side of the river, akabas traversing the plain in all directions, and labourers busy at the plough, presented a cheerful sight: numerous villages scattered about the plain were visible in the distance. The Russians have guards stationed at certain distances along the bank of the stream, for the double purpose of preventing the importation of contraband articles and of hindering their soldiery from deserting—both objects, however, are but imperfectly attained. The contraband traffic is carried on with the assistance of the villagers whose habitations lie near to the stream, which is crossed during the night, and the goods transported by bye-paths from village to village to the place of disposal. I was told, however, that the smugglers have of late been much more closely watched, and that they have been obliged in a great measure to suspend their operations.

Our road led us by the Persian villages Karaklissia, and Aralik, which latter has a tower; and, fording the Kara Khan river twice (the same which we yesterday passed at Kizil Charchak), came to another village named Bash Surijeh, which has also a tower, a large and handsome building in the style of a church, which it probably was at some distant period. Here our road turned off to the W.; we ascended to higher ground and proceeded S.W. At the third hour we forded the Kars river, and immediately passed the village Arghuzun. A little S. of this the Kars river forms a junction with the Arpa Chai (the latter having already been augmented by the Kara Khan), and the three united streams then flow towards the Arras. Our road from Arghuzun led in a general direction S. past the village Illanli which is inhabited by Persians, near another village, and soon after to the banks of the Arpa Chai, after its junction with the Kars river. Continuing in the same direction, we reached the plain of Anni, at the commencement of which we passed on our left a church with a village near it: the plain is of no great extent, and is an arid, stony, and almost desert tract. Thus far we had traversed since the morning a fine grazing country, which is cultivated only in the vicinity of the villages; few flocks or herds were to be seen, and the country seemed deserted except on the immediate line of our road. We crossed the plain in a south-westerly direction, and reached Anni at about half-past 1 P.M.

Outside this ruined and deserted town we found a few inhabited houses, in one of which we took up our quarters; and I then proceeded to visit the ruins. They are situated on the S.W. corner of the plain on a plateau, which is bounded on all sides but one by a deep ravine. The Arpa Chai flows at the foot of it but on one side only, and continues its course S.W.; a bridge of ancient construction affords a communication with the opposite bank of the stream. The sides of the ravine exhibited a deep stratum of very soft sandstone, hollowed into innumerable holes and caves, probably in most cases for sepulture; many of them, however, were shaped like apartments, and may have served as habitations for the living: at present the wandering Kurds sometimes make these caves their abodes during winter. Ascending to the town from the ravine, I was struck with the solid and beautiful masonry of what remains of the walls and palace—the former are double on the side unprotected by the ravine, the outer one bearing evident marks of the strife that must once have raged beneath them. They are marked with innumerable small indentations, produced very probably by the points of arrows or other sharp weapons with which the defenders of the walls were assailed.

The remains of the palace are extensive, and several of the apartments are entire, with the exception of the roofs. The quantity of materials which has been carried away for buildings in various parts of the country is probably the chief cause, more than anything else, of the ruined state of this building and that of the city walls, both which, as I have before observed, being of remarkably solid construction, seem capable of resisting the wear of time for some centuries to come if undisturbed by earthquake and the destroying hand of the Turk. In many places, however, the walls have been actually undermined to get at the materials. In some places I observed great masses of stone supported merely by the adhesion of the mortar, which would prove the latter to have been of a very superior quality. There are many long Armenian inscriptions on the walls in excellent preservation; I also observed on them the figures of a tiger, a horse, and of a man holding something globular in one hand. The area within the walls is covered with the prostrate remains of the houses, the forms of some of which may still be traced among the ruins, as may the outlines of some of the streets. Several spots unencumbered by ruins would probably mark the former positions of public squares. Four or five churches, still in tolerable repair and of neat construction, remain as proofs of the taste of their Armenian founders; one of these, indeed, may justly be termed an elegant and handsome building: all have long inscriptions in Armenian, which it would require some days to copy; and the interior of the walls are painted like other Christian churches in

Turkey with the figures of saints and other subjects from sacred history. Besides these edifices are two towers resembling Turkish minarets; one of them has an Armenian inscription with a few Turkish characters above it, which may perhaps be symbolical of the vassalage under which the government of this petty Armenian kingdom was held. On the highest part of the plateau overlooking the ravine was situated the citadel, now apparently little more than a mass of ruins, though I did not ascend to it, owing to my indisposition at that time.

Anni, the capital of the Pakiadian kings, was captured with great slaughter of the inhabitants by Alp Aslan, one of the Seljúkian princes, who succeeded Togrul Beg, the Turkish or Tatar leader in 1063, and subsequently filled the Persian throne. Kaghig, the king of Anni, was banished to Cæsarea, and the town after its capture was given by the conqueror to a tribe of Kurds, who in their turn yielded it, after a violent struggle, to one of the kings of Georgia. This place is situated at 9 hours from Gumri, and nearly the same distance by the direct road from Kars.

21*st.*—We took our departure this morning at about eight o'clock, our road leading us for a short space in a direction W., and presently S.W. Soon afterwards we proceeded S. over a flat country, in taking which direction Ararat bore S.S.E. of us. Passing on our right a village called Cosujah, situated at the foot of low hills, we presently altered our direction to S.W. by S., and ascended to higher ground, where we found a small encampment of Kurds. During this much of our journey to-day I have observed no appearance of cultivation except near Cosujah, but the country affords fine grazing. Our route altered to S.W., and we traversed some flat ground, passing a village named Alem, which has a church: the inhabitants are Armenians and Persians. Ararat bore S. by E. of this village, and S. and by W. is an elevated peak, with Keorogli Kalissi, a castle, now in ruins on its summit. To our left, part of the plain of Erivan was visible—still no symptoms of cultivation except immediately around the villages. We passed those of Digiole and Zebné towards the end of the fourth hour, the latter having a church in it. From hence the direction of our route was S. by W., which took us across some hills, and we descended into a valley to a large Armenian village called Zechchi, possessing also a church of neat construction but falling to decay. Our road from this led us S.W. through a well-cultivated country and near two or three villages, but we were overtaken with such a fierce storm of rain, wind and thunder, that whilst it lasted, and that was for a considerable time, it was impossible to take any notes; it ceased as we approached the Kurghesman valley, into which we descended on

foot by a long and difficult path along its side until we reached at about 6 P.M. the pretty Armenian village of Kess, situated in a recess of the valley amidst gardens and groves of fruit-trees, chiefly the apple, pear, mulberry, and walnut. I wished to push on to Kurghesman that evening, but was dissuaded from making the attempt by the wretched condition of our cattle (the same which had brought us from Kars), and by the peasants assuring us that it would be impossible to get across the Arras during the night, as the ferry by which it is passed is not continued after sunset, and the river was too much swollen to admit of our fording it. On the opposite side of the valley we could observe a large encampment of the Jennukki Kurds, amounting, I was told, to about 300 tents. These people frequently pass the river, and plunder the unfortunate villagers of whatever comes in their way; and so reckless are they of the injury they may be doing these poor people that they not unfrequently, I was assured, in the wantonness of their mischief, destroy the vines and trees, on the produce of which the villagers mainly depend for many of their little comforts.

22nd.—We left Kess at about 7½ A.M., and continued our road up the valley, which runs nearly E. and W. Its general feature is a bold and rugged outline; its length, breadth and depth, are very considerable; but it is not otherwise remarkable, being devoid of trees and cultivation, except in some few parts. Mountains of great height form its southern side, in the recesses of which I was told the oak is found. We gradually approached the Arras, on the opposite bank of which Kurghesman is situated; the ferry being higher up the stream, we passed Kurghesman, and on our way met the mutzellim of that place, who appointed one of his attendants to accompany me to it and provide us with horses. In about half an hour we reached the ferry, which is effected by means of a raft of wicker-work supported on inflated skins—it is so unwieldy an affair that to track it up against the current to the proper place for a start is a work of some difficulty and time. We, however, got across on it very well, the current bearing us along with great rapidity till we reached the opposite bank. A man with a long wooden shovel, which he used both as an oar and rudder, sometimes on one and sometimes on the other side of the raft, steered us with much dexterity across the stream. Our horses were then driven over, the water occasionally reaching above their shoulders. At this part I should think the river must be about 80 yards in breadth. Having replaced our baggage on the cattle we turned back to Kurghesman, which proved to be a large cassaba, containing about 200 families of Turks and Christians, and is embosomed in gardens and groves of fruit-trees; the pear, apple, plum, cherry and walnut trees, appeared to be in

great abundance; and it is from hence that the surrounding country is supplied with these productions. I was unable to procure horses to proceed with at once, and was detained here till the following day.

23rd.—We got off soon after daylight. The road from hence across the mountains was declared to be impracticable, owing to the depth of snow still remaining on them. I was therefore forced to take the more circuitous route by Zerap Khauch, where I was erroneously informed I should find fresh horses to proceed with. We procured excellent cattle at Kurghesman, and resumed our route up the side of the valley, which led us continually by steep ascents and descents, and by narrow and precipitous paths, which much fatigued our horses. The valley, serpentining in a general direction of S.W., narrowed gradually as we advanced, the Arras occupying nearly its whole breadth at the bottom, which sometimes obliged us to scramble over rocks overhanging the stream. At about the 4th hour we turned up another valley, leaving the Arras to our right, flowing from a northwesterly direction, and soon after we alighted at the Kurdish village Zerap Khauch, which contains 50 or 60 houses: very few of the inhabitants could understand Turkish. Here no horses were procurable; and my guards, who were furnished me from Kurghesman without my applying for them, refused to proceed any further. They should have been quite at liberty to return, but, to my mortification, I discovered that they were in truth the owners of the horses we had hired. After a vast deal of uproar, and a show on their part to take the horses away by force, which I was determined to resist, I mounted, telling them that they might follow or not as they pleased, but that they should not get their horses till I reached Toprak Kaleh; and starting off with my own people, and driving on the loads, the fellows soon made up their minds to follow me.

A small and rapid stream flows through this valley and unites with the Arras. Our road led us up its side in a south-westerly direction for a short space, when we quitted it to ascend by a steep path to some flat country, crossing which, and passing two wretched villages, we arrived at a third, called Gholojah, inhabited solely by Kurds. Here I had promised the guards that I would rest the horses before crossing the mountains in front of us; we accordingly put up at one of the houses, where we procured refreshments. The females of the house did not conceal their faces; one amongst them was young and good-looking, and apparently but recently married, but she was sadly disfigured by a ring, with a large flat ornament to it, which hung to the side of her nose, and which frightful appendage seemed to be considered only proper for the youthful, as I did not observe any of the

elderly matrons similarly distinguished, neither did I see any nose encumbered with more than one ring.

This is apparently a flourishing village, the inhabitants being rich in cattle and other live stock. They appeared to be a very hospitable and inoffensive people. I had a renewal of the dispute with the guards, who refused to proceed that evening across the mountains, on account of the danger of the road, although they had promised to take me across before next morning. They pretended that the road over the hills was infested with Kurds, who would inevitably rob and murder us all; and they induced the villagers to represent the journey at night as fraught with danger to the party, and likely to entail serious consequences on them in the event of any misfortune befalling us. I had, however, made up my mind, and, convinced that there was no real danger to be apprehended, and being very desirous of pushing on, I refused to listen to any arguments for delay. However, we did not get off before nine in the evening: several of the villagers volunteered to escort us over the hills, in expectation of a present, and thus accompanied—our other guards having also decided on following—we resumed our journey. The moon had not risen, and we had to grope our way in complete darkness, our path leading through a valley to the mountains; on reaching which the ascent presently became very steep—in some places almost perpendicular—the horses toiling up with extreme difficulty. I walked the whole way up, and, encumbered with heavy travelling clothes, which, with the exertion, kept me in the most profuse perspiration, found it no easy matter to keep up with the party, from fatigue and exhaustion. I was sorry not to be able to ascertain the height of these mountains. The snow was still lingering on them in deep patches about the summit; on attaining which the moon had risen, enabling us to find our way down the other side by a long and tedious descent. As to the danger of the road from robbers, we encountered none, not meeting with a soul on the way. Descending into the plain of Alishkert, we moved along it at a rapid pace, and reached Toprak Kaleh just at daylight. I immediately ordered fresh horses to proceed with, and lost no time in taking advantage of the interval thus afforded me to get some sleep.

Toprak Kaleh has a small fort crowning the rock on which the tower stands. The place may contain 150 to 200 houses, of which about 50 belong to Armenians. The plain is a fine tract of rich soil, watered by the Murad Chai and many smaller streams; but here again the scarcity of hands to cultivate it leaves nearly the whole a waste, on which the scanty herds of the few villages remaining inhabited on it find abundant pasturage. The departure of the Armenians with the Russian army was the first

cause of the present deserted appearance of this plain; many of the emigrants, however, returned to their former houses, but most of these again abandoned the country, to escape the persecutions of Temir, pasha of Bayazid, and the oppression of the Kurdish tribes.

I refer to a note below for distances of places situated on my route from Erzerum to Toprak Kaleh; and to that of a series of barometrical observations from the former place to Tabriz, in Persia.

Itinerary.

Erzerum to Itt	13 hours.	
Itt to Bardos	11 ,,	Post station.
Bardos to Kars	12 ,,	Ditto.
Kars to Ajak Kuli, near Gumri .	12 ,,	
Ajak Kuli to Anni . . .	8 ,,	
Anni to Kurghesman . . .	12 ,,	Ditto.
Kurghesman to Zerap Khauch .	6 ,,	
Zerap Khauch to Toprak Kaleh .	7 ,,	Ditto.
	81 hours.	

Barometrical Observations.

Place.	Remarks.	Barometer.	Centigrade Thermometer.	
			D.	A.
Erzerum	Mean of 3 observations.	23·987	14 8	15·1
Ghirreh Kusak . . .	,, 2 ,,	23·677	9·5	10·2
Mountain Road, 5 hours from ditto, highest part . .	,, 1 ,,	22·200	10	9·5
Itt	,, 2 ,,	24·545	8·2	10·2
Mountain Road, 6 hours from Itt, highest part . .	,, 1 ,,	22·622	4·5	5·3
Bardos	,, 2 ,,	24·348	6·3	9·1
Kars	,, 3 ,,	24·522	14·1	14·8
Ajak Kuli, near Gumri .	,, 1 ,,	25·312	5·1	7·8
Anni	,, 2 ,,	25·335	17·4	18·1
Kess	,, 1 ,,	25·570	16	17
Kurghesman	,, 1 ,,	25·448	20	20·2
Toprak Kaleh	,, 1 ,,	24·530	20	20·6
Kara Klissia	,, 1 ,,	24·950	14·3	15·1
Diyadin	,, 1 ,,	24·112	17·4	17·5
Bayazid, halfway up the hill .	,, 1 ,,	24·322	11·8	13·5
Kara Ayna	,, 1 ,,	24·450	17	17·5
Surface of Urumia Lake. .	,, 1 ,,	25·900	22	23·1
Tabriz	,, 6 ,,	25·489	25·3	25·2

VII.—*Report on the Route from Tajurra to Ankóbar, travelled by the Mission to Shwá, under charge of Captain W. C. Harris, Engineers,* 1841 (*close of the dry season*). By Assist. Surgeon R. Kirk, Bombay Establishment.

May 17th, 1841. Tajurra. Water good and plentiful; forage scarce.

The mission left Aden on board the H. C. brig Euphrates, on the 15th of May, 1841, at noon, and reached Tajurra on the morning of the 17th of May, the passage having occupied 42 hours.

Tajurra, situated on the northern shore of the extensive Bay of Tajurra, in lat. 11° 46′ 35″ N., and long. 43° 0′ 20″ E., is a Dankali town, the residence of Sultan Mahomed, a chief of the Adal tribes. It contains about 300 houses, composed of wooden frame-works covered with matting; and has a population of 1200 or 1500 inhabitants, principally engaged in the trade in slaves and salt with the markets of Aussa and Abyssinia. There is no bazaar at Tajurra, but the smaller supplies can be obtained in exchange for beads, buttons, fish-hooks, or tobacco. The anchorage is very limited and insecure during the S.W. monsoon; a plentiful supply of water of good quality is obtained from a well to the N.W. of the town, near a group of date-palms; there is no cultivation in the vicinity, and grass or forage for horses is very scarce and obtained with difficulty.

In the immediate neighbourhood of Tajurra are cliffs of coral growth, succeeded by rounded limestone hills, the horizon being bounded by a peaked range of basaltic formation, the district between the hills and shore being clothed with a low acacia jungle.

The climate during the latter portion of the month of May was very warm, the therm. ranging from 96° to 98°, but rendered less oppressive by the sea-breeze, which generally sets in about 11 A.M.

30th.—Anbábo, 4 miles, S.W., 1½ hour. Road good; water abundant in pools in the bed of a stream from the hills; forage, short grass near the margin of the stream.

The road to Anbábo runs either on, or parallel to, the beach; our encamping ground was on the bank of a small mountain stream, about 1 mile to the eastward of Anbábo, which is a small Dankali village, situated near a group of date-trees.

June 1st.—Dullul, 7 miles, S.W., 2½ hours. Road good; water abundant, from wells; forage, short grass, on plain.

The road from Anbábo is very good, running over the sandy beach. Dullul is a Bedawi encampment, near some wells, situated at the abutment of a spur from Jebel Gudah, of trachyte formation. Therm. max. 96° in tent.

3rd.—Sagallo, 2½ miles, S.S.W., 1 hour. Road good; water abundant, from wells; forage scarce.

The road passes along the beach; 1 mile from Dullul we passed the wells of Suktá. Sagallo being the last station at which water can be obtained before passing the Salt Lake, halted one day to fill the water-skins. Therm. max. 96°.

5th.—Wárdelihán, 14 miles, S.W. and W., 6 hours. Road, after leaving beach, difficult and pebbly.

For the 4 first miles the road passed to the S.W. along the beach, and then struck off to the westward, over low undulating hills covered with basaltic boulders, forming a very bad road for mules and camels. 7 miles from Sagallo we came to the narrow ravine of Gulalafu, about ½ mile long, 60 to 80 feet in breadth, and bounded by precipitous cliffs about 150 feet high. This pass opens into a hilly table-land, traversed by an extensive valley, running up to Jebel Gudah, crossing which, after a march of 14 miles, we reached the halting-ground of Wárdelihán, situated on a barren pebbly plain, affording neither water nor forage. Height above the level of the sea by means of barom. and therm. observations, 1697 feet; notwithstanding which elevation, the climate was scarcely less oppressive than in the lower country.

6th.—Muyà, near Salt Lake of Asal, 16 miles, S., afterwards westerly, 8 hours. Road exceedingly difficult, impassable for wheeled carriages.

On leaving Wárdelihán the road suddenly descends into the Pass of Raïzán, a most formidable ravine; the path for 2½ miles is bound in by precipitous cliffs of basalt of several hundred feet elevation, being in parts exceedingly steep, and obstructed by large fallen masses of rock. The pass then merges into a narrow valley, which descends for 2 miles to the southward, opening on to a plain of black lava, extending to the shores of Gubat-el-Kheráb. The road after leaving the valley passes to the N.W., along the foot of a low range of hills, at the end of which the lofty peak of Searo, with the Bahr Asal (Salt Lake) at its base, comes into view; then passing over 8 miles of volcanic country, a limestone substratum occasionally showing through the sheets of lava, we came to a precipitous path down a lava cliff, of about 100 feet elevation, exceedingly steep and difficult for laden camels, descending which, we arrived on the sandy plain of Muyà, and encamped about a mile from the margin of the lake.

By observations taken by Lieut. Christopher, I.N., the S.E. shore of the lake near this station was determined to be in lat. 11° 38′ 12″ N., and long. 42° 33′ 6″ E., and the mean of bar. and ther. observations gave a depression of 570 feet below the level of the sea. The Bahr Asal is of an oval form, about 7 miles across in its longer diameter, which runs from N.E. to S.W.;

about one-third of its surface is covered with a level sheet of salt; it is shut in on its northern, western, and southern shores by ranges of mountains; whilst on the eastern side a bed of lava, containing several deep craters, separates the waters of the lake from Gubat-el-Kheráb, of which it appears to have once been a continuation. From this lake the Danákil traders procure the supply of salt, which they convey to the markets of Aussa and Shwá.

The climate at this station was most oppressive, a hot simoom from the N.E. blowing during the greater part of the day, the ther. in the shade rising to 126°. Our supply of water being exhausted, it was determined to make a night march to the next station, leaving the baggage to follow.

7th.—Gungunta, 16 miles, W.S.W., 10 hours. Road very difficult; water plentiful, but brackish; forage, a little grass on margin of stream.

We started on the rising of the moon, at 11 P.M. The path along the shore of the lake being nearly impassable for cattle from the rugged and brittle nature of the lava sheets, we took the upper road, and crossing the Muyà plain, passed in a south-westerly direction over successive ranges of lava hills, in some parts exceedingly steep and difficult, in others winding along the valleys between them, or near the margin of the lake. Suffering most severely from the oppressive heat of the night, and intense thirst, we at length reached the Well of Haulefanta, in a small rocky nook, distant about 10 miles from Muyà. We there passed to the margin of the lake, and over the salt plain at its S.W. extremity for 2 miles, then crossing a low range of hills we descended into the dry pebbly bed of a river, which in the rainy season, rising from Alluli, at the highest point of the Gallo range, flows into the S.W. corner of the Bahr Asal. Proceeding for a mile up the bed of the river, which runs through a narrow valley, we came to a small stream of running water, and shortly afterwards reached the halting-ground of Gungunta, where the valley is shut in by precipitous and lofty cliffs of basalt and porphyry. We passed a very hot day in some caves formed by the fallen masses of rock from the mountain. The ther. rising to 110°.

8th.—Many of the camels of the kafila not having arrived from Muyà, we halted this day, and at night two European soldiers of the escort and a Portuguese cook were murdered in their sleep by some of the mountain Bedawi in the neighbourhood.

9th.—Alluli, 9 miles, S.W., 4½ hours. Roads in parts difficult and rocky; water plentiful, but saltish; forage, a fine grassy patch at head of stream.

Left Gungunta at 9 A.M., the road passing in a W. and S.W. direction through the Wadi Kallu, which intersects the Gallo range: ¼ of a mile from camp the camels had to ascend a most diffi-

cult steep, a rude road having been constructed up the face of a steep rock; the road then became comparatively easy, winding through a narrow ravine faced with precipitous rocks of basalt, water being plentiful the whole way; and we passed several green grassy spots, and an occasional group of palm-trees. As we proceeded, the hills decreased in altitude; and after a march of 9 miles we reached the head of the stream, at a small grassy plain called Alluli, where we halted under a clump of doom palm-trees.

By ther. observations Alluli was found to be 228 feet above the level of the sea. So much mercury had leaked from the barometers, owing to the extreme heat they had been exposed to, that no reliance could be placed on their indications; and subsequently in the course of the journey their tubes were broken, notwithstanding every precaution in their carriage.

10*th*.—Several camels not having arrived, and this being a good spot to recruit, our cattle halted for the day.

11*th*.—Bedi Kurnoff, 16 miles, S.W. and S., 6½ hours. Road good; water in pools, brackish; forage scarce.

Started at ½ past 1 A.M., and passed to the S.W. for 3 miles over low rounded hills and small barren plains; the road then opens on to the extensive plain of Gagade, about 8 miles in breadth, and bounded to the N.W. and S.E. by distant ranges of mountains. From hence the caravan route to Aussa branches off, running up the valley to the N.W., said to be 3 days' journey for a kafila. Our road crossed the plain to the southward, and passed for the first 2 or 3 miles over a surface of hardened and cracked alluvial deposit, much resembling the deserts of Upper Scinde. We then passed through a thin jungle of acacia and a species of spartium, and near some low hills, on the southern side of the plain, came to the dry pebbly bed of a stream, which, dividing into two branches, expends itself on the plains. Leaving Gagade and following the bed of the river, the road enters a small valley in which we found some pools of bitter and undrinkable water; we shortly afterwards reached the station of Bedikurnoff, and pitched our camp on a small stony hill, above a wooded hollow, in which water was found, but of a brackish taste.

12*th*.—Saggadereh, 8 miles S.W. and S.E., 3½ hours. Road good, in parts stony; water in pools, brackish; forage scarce.

Started at 3 A.M.; the road for the first 2 miles passing over low stony hills, we then entered the Wadi Kurri, a most verdant-looking valley from 200 to 300 yards in width, and studded with low palm-bushes, tamarisks, and acacias, whilst we passed frequent flocks of goats grazing, under the charge of women and children, and at every turn of the road we saw groups of the inhabitants assembled on the edge of the hills watching our progress. The hills bounding the valley were of no great elevation, being

composed of basaltic and porphyritic rocks, with occasionally conglomerate and sandstone. After a march of 8 miles reached the halting-ground of Saggadereh, near the head of the valley. Ther. max. 110° in tent; lat. of Saggadereh 11° 19′ 5″ (Lieut. Barker's obs.)

13*th*.—Marha, 4 miles S.E. and W., 2 hours. Road stony; water good, but distant; forage scarce.

Started at ½-past 5 A.M.; the road leaving the wadi, and passing over a low hilly country, and then for a mile over a stony plain thickly covered with basaltic pebbles, when we reached the halting-station of Marha, near the foot of a low range of hills. The surrounding country was of the most dreary aspect, fields strewn with boulders of lava and basalt met the eye on all sides, with scarce a trace of vegetation. A lofty range of hills was pointed out to the westward, distant about 15 miles, behind which Aussa was said to be situated. Our supply of water was obtained from pools 2 miles distant. Ther. 109°; lat. of Marha 11° 17′ 6″ N.

14*th*.—Daduh, 15 miles southerly, 8 hours. Road stony; water in pools, bed of river; forage plentiful.

Marched at ½-past 2; ascended the low range, and reached the summit of a table-land, the same dreary wilderness as yesterday, the country being completely strewn with rocks and boulders of lava, with, however, a few patches of coarse grass, a most welcome sight for our exhausted cattle. We crossed the plain for 6 miles in a southerly direction, and then descended into a small level spot surrounded by low rounded hills, and soon after entered the fine level plain of Galamo running to the N.W., crossing which we came to the broad dry bed of a stream called Chaikaito, in which there were marks of the water at times rising to the height of 12 or 15 feet; it is formed by the junction of two streams, one rising from the S.E. range of mountains, the other from the Góbád plain; it is stated in the rainy season to flow into the lake formed by the Hawash at Aussa. Passing along its western branch, we shortly entered the small valley of Ambaido, thickly wooded and abounding with grass; afterwards crossing a grassy plain, on which four ostriches were seen, we again descended into the valley, and encamped at a station called Dadah, near the bed of the river, in which water was found on digging. Ther. at sunrise 83°, at 3 P.M. 111°.

A road to Zeïla is said to branch off here, being 4 days' journey: the road being good, and water plentiful.

15*th*.—Góbád, 12 miles southerly, 6½ hours. Road good, but in parts stony; water abundant; forage abundant.

Started at ¼-past 3 A.M.; the road running S.S.W. across the level sandy plain of Kumodali, abounding with coarse grass. We here saw the first cone of the termites. Passing over the plain

for 5 miles, we came to a low hill, which we ascended, on to a second slightly elevated track, over which the road ran for 3 miles; we then descended a ridge of lava-rock, on to a grassy plain; crossing this we came to some ridges of lava, and then descended into the plain of Góbád, and encamped near the bed of its river. The valley of Góbád appears to extend from 10 to 12 miles to the westward; to the S.E. it is more shut in by hills; its elevation above the level of the sea was found to be 1057 feet, and observations made by Lieutenant Barker place our halting-spot in lat. 11° 0′ 56″ N.

16*th*.—Halted.

17*th*.—Sunkul, 4 miles S.W., 2 hours. Road stony and rough; water in wells, good; forage scarce.

Started at ½-past 6 A.M.; crossed the plain, and ascended the range to the S., then passed over a stony plain covered with basaltic pebbles, and descended into a small valley, in which were some wells of good water; proceeding ½ a mile further, encamped at the station of Sunkul, after a short march of 4 miles. Ther. at max. 108°.

18*th*.—Sugagedan, 7 miles southerly, 3 hours. Road level, but stony; water none; forage plenty.

Started at 6 A.M.; ascended from the Sunkul valley, which seems to be the focus of several smaller valleys, on to the table-land of the Hudali range, the road running S.S.W. over an extensive stony plain thickly studded with grass, and much resembling the plains of the Deccan. Having passed 4 miles, saw goats at a short distance to the eastward, which we were told were near the encamping ground of Arabdereh. After 2 more miles, we came to the brow of the Hudali range, commanding a fine view over the Dulul valley, which is about 6 miles in breadth, running N.W. and S.E., being the direction in which I have found all these plains to extend. To the S. it is bounded by the Mari range, which forms a high table-land, with a steep sloping and in parts precipitous face. Descended the hill, a height of about 200 feet, and then skirting its base for a mile to the S.E. halted on the plain, at Sugagedan, near the edge of a tract of lava-boulders. Found abundance of grass, but no water. Lat. of Sugagedan, by Lieut. Barker's observations, 10° 53′ N.; ther. at sunrise 84°, and at 3 P.M. 108° in tent.

19*th*.—Dawaileka, 9½ miles westerly, 4 hours. Road good; water abundant and good; forage plentiful.

Crossed the Dulul plain in a W.S.W. direction, a perfect level, covered with coarse grass. On the march saw a herd of twelve wild asses; after passing over 8½ miles, came to a dell in the Mari range (which is here about 1000 feet high), in which we found an abundant supply of good water. Having filled up our

skins, proceeded a mile to the westward to a small open space, where we encamped. By the boiling-point of thermometer, the Dulul plain at Dawaileka was found to be 1228 feet above the level of the sea. Ther. at sunrise 86°, at 3 P.M. 107° in tent.

20th. — Umarguluf, 8½ miles W.N.W., 3½ hours. Road good; water none; forage plentiful.

At daybreak returned to the pool in the dell to fill our water-skins, none being procurable at our next station. We then skirted along the foot of the Mari range in a W.N.W. direction, the plain for about 6 miles being a perfect desert. We then came to a grassy tract, in which a few antelopes were grazing, passed a small detached hill, and soon after entered a jungly patch, near which we halted, at a spot called Umarguluf; the plain is here divided into two valleys, the southern one taking the name of Wadi Arfa, up which is a caravan-route to Aussa, passing over the Ubnu range in a W.N.W. direction, said to be 2 days' journey for a kafila. The Mari range at this point is about 1000 feet high, basaltic, and its base strewn with huge blocks that have become detached from its face. Saw here a fine effect of the *mirage*, the plain resembling an extensive lake, with the projecting points of the mountain forming deep bays and headlands. Ther. at sunrise 87°. In the evening the sky became darkly clouded, and we were in hopes that rain would accompany it and diminish the extreme heat of the weather; it proved, however, to be a hot simoom from the N.E., bringing with it clouds of dust.

21st. Amadu, 7½ miles W., 4 hours. Road good in plain, afterwards stony; water plentiful, good; forage plentiful.

Started at ½-past 3 A.M.; the road as yesterday skirting the foot of the Mari range to the westward, the desert tract extended for 3 miles, and we then entered on stony ground, thickly strewn with rounded masses of basaltic rock, apparently the *débris* of the neighbouring hills; at 4½ A.M. we came to a road over the hill, which is here much diminished in height; ascended and crossed the hill, the path winding amongst blocks of lava and basalt, rendering the road so bad that the camels proceeded by a more circuitous route round the abutment of the range. Having crossed this lava-ridge, we had an extensive view over the plain of Amadu, running parallel to and bounded to the N. by the Mari chain, to the W. opening into the Wadi Arfa, and to the E., at the distance of 5 miles, divided into two valleys. Crossing the plain for 2 miles, we came to a fertile patch under the opposite hill, where in a rocky nook we found a fine pool of good water, at which herds of cattle, with numerous donkeys and flocks of sheep, were being watered; during the scarcity of water in the surrounding districts this seeming to be a favourite encampment with the neighbouring tribes. Ther. max. 106°.

22nd.—Koranduduk, 3½ miles, S.W., 2 hours. Road stony; water abundant and good; forage scarce.

Started at ½ past 5 A.M.; our road passing to the W.N.W., over a low hill into a stony table land, covered, as usual, with basaltic boulders: passing which table-land, for 2 miles, we came to a small desolate hollow, in which were 4 mat-huts, inhabited by goatherds. We crossed it, for ½ a mile, to a narrow precipitous ravine, a short distance up the bed of which we found a fine pool of water, at which we watered our cattle; then returning to the hollow, ascended the hill, and proceeding ½ a mile, encamped on a small dreary plain, covered with lava pebbles, called Koranduduk. To the southward the view is scarcely more promising; with the exception of a few acacia bushes at Fialu, and a bathing-place about a mile distant.

Ther., daybreak, 85°; 3 P.M., 106°. Height above level of the sea 1605 feet.

23rd.—Halted.

24th.—Barudega, 15 miles, S.W., 7 hours. Road good; water none; forage scarce near encampment.

Marched at ½ past 3 A.M.; passed over rocky, broken ground for 1½ mile; then entered on the extensive sandy plain of Killele: crossed it to S.W., the road skirting along the foot of a low undulating range of hills to the westward (the termination of the Eysa range) This is the most extensive plain we have as yet seen—the horizon being bounded only by the blue ranges of mountains 20 or 30 miles distant; the whole tract apparently covered with parched grass. After a march of 15 miles, over an excellent level road, reached the halting-ground of Barudega; the plain in the vicinity thickly strewn with basaltic pebbles. A high peak, called Kuffal Ali, S.S.E., and apparently forming a head-land, extends into the plain. Ther. 108°. At night the sky appeared very overcast and stormy, and a few drops of rain fell.

25th.—Killele, 12 miles, S W., 5½ hours. Road over plain good, afterwards stony; water abundant; forage rather scarce.

Marched about 4 A.M., and continued, as yesterday, to skirt the range to the westward; the road, after a mile, becoming shut in by a similar low range to the E. After crossing the plain, 7 miles, the road passed up a bushy ravine, and then wound over low rocky hills for 3 miles. We passed many herds of cattle and sheep on the road, all proceeding in the direction of Killele; and, on reaching the brow of the last hill, long white streaks of sheep and goats were seen descending the sides of the opposite mountain; whilst the lowing of cattle and bleating of sheep rose from the ravine, in which water is found: it was in pools of 30 or 40 feet in length, but muddy and defiled by the thousands of cattle watered at them; as this station at present appears to contain ar

assemblage from all the tribes, driven here by the failure of water in the plains.

Killele, by Lieut. Barker's observation, is in lat. 10° 34′ 33″ N.; and, by the boiling-point of water, I found its height above the level of the sea to be 1542 feet.

Killele is a narrow ravine, bounded by basaltic cliffs of from 800 to 900 feet elevation; to the W. steep and precipitous, but of less height and easier of descent on the E. It appears to be the point to which the waters from the Killele and Gayel plains, and some of the mountains of the Galla tribes, flow in their course to the lower country near the Hawash and Aussa, in which direction the Killele Wadi appears to extend: Aussa being said to be 3 days' journey to the N. for a kafila; Hurrar was also stated to be 3 days' journey distant for a messenger. Ther. 108°.

27th.—Slight rain at night.

28th.—P.M., sky very cloudy; and heavy rain set in about 8 P.M.

29th.—Ther., sunrise, 77°; max. 94°. No rain; night very cloudy. Were detained at Killele 5 days, owing to the disputes between the leaders of the kafila and the native chiefs assembled at the watering-place. At length everything was settled.

30th.—We once more resumed our journey. The usual route taken by kafilas passes over the hill on the S.W. side of Killele, and emerges into the plains to the S. of Jebel Abida, at Ras Mittur; but water was reported to be so scarce along this road that our guides determined, after long deliberation, to take the Badu route, which, crossing the Pfio range, passes to the northward of Jebel Abida to the banks of the Hawash; though they stated it was so unsafe, from the predatory habits of the Mudaitus, through whose country it passes, that it had not been travelled by kafilas for several years.

Warimilli, 7 miles, N.W. and S.W., 3 hours. Road stony; water good, but distant; forage plentiful.

We started at 7 A.M., the road passing to the north-westward, up the Killele wadi, in which we saw several fine pools of water. Leaving the course of the valley, we then struck over low undulating hills, plentifully strewn with the common pest of this country, stones, amongst which we found numerous fragments of obsidian. After a short march of 7 miles, during which the country ascends considerably, we descended into a small open plain surrounded by low hills, where we encamped. Warimilli, our present station, was found, by the boiling-point, to be 1752 feet above the level of the sea. Water was only procurable from the Killele wadi, distant 1½ mile; in which, during the rainy sea-sea, crocodiles are said to be found. Very stormy and blowing to-night, but no rain.

July 1st.—Halted to-day, the men having been sent to report

on the water in advance: reported very unfavourably. No rain at night.

2nd.—Nagakumi, 15 miles, S.W., 7 hours. Road good; water none; forage plentiful.

Started at 6 A.M., passing to the westward and S.S.W., over low stony hills, on which we saw several flocks of sheep grazing; then came to a cluster of small beehive-shaped mat-huts, and descended into the small valley of Dumi, running N.N.E. and S.S.W.; passed along its course for 2 miles, when, ascending its western bank, we came on a level table-land, covered with dry grass, and extending for a great distance to the E. and W. Crossed the plain to the W.S.W. for 5 miles, when we came to a small projecting hill, having a cluster of huts on its summit; and then passing another mile to the westward, encamped at Nagakumi, under a second low point. No water to be found; but the whole face of the country was covered with dry parched grass. A range of peaked mountains in sight, called Jébel Pfio, extending from the N.W. to S.W., and distant about 12 miles. 4 P.M., a heavy shower; at night, much lightning to the southward, but little rain.

3rd.—Meinhatolli, 15 miles, S.S.W., 8 hours. Road stony; water in pools; forage abundant.

Our guides having learnt that, owing to the rain, water would be found on the southern road, determined to strike into that route from this station. Started at ½ past 5, passed to the westward for a mile, over broken jungly ground, when the hills closed in, and our road ran through a narrow valley, abounding with grass and verdant-looking bushes; ascending from the valley to the westward, our path led to the S.S.W., over a jungly and stony plain: the whole country basaltic, and the ground strewn with fragments of obsidian. At 10th mile came to a green fresh-looking patch of bushes at Arnut, where herds of cattle were grazing in the neighbourhood of some muddy pools of water: after watering the mules we again resumed our journey, and soon entered a long narrow valley, bounded by low sloping hills, which, with the bed of the valley, was thickly clothed with dry grass; proceeding through this for 5 miles, we encamped at Meinhatolli, a halting-place near some pools of muddy water; whilst, on the surrounding plain, numerous herds of cattle were grazing. Owing to the late falls of rain, and the elevation of the country (about 2000 feet), we have found the climate, for the last few days, much less oppressive. 7 P.M., heavy rain, with severe gusts of wind, continuing for about 2 hours. The lofty ranges of Abyssinia were distinctly visible from this station.

4th.—Madera Dubba, 15½ miles, S.S.W., 9 hours. Road good; water none; forage abundant.

Started about 5 A.M. Having passed a mile through the valley, we emerged into the fine plain of Mirihan, bounded to westward, at a distance of about 10 miles, by the lofty peaked range of Pfis; to the eastward by the sloping Bundura range, at the foot of which our road ran the whole day; it varies in height from 600 to 1000 feet, its sides being thinly clothed with grass; 5 miles from camp to a small detached hill of compact limestone, containing impression of small spiral shells, the surrounding rocks being, as usual, a cellular basalt. The plain of Mirihan is a fine light-coloured soil, thinly strewed with pebbles; the grass much improved by the late rain, and acquiring a greenish tint. At 9th mile came to a ravine, being the opening of the Wadi Bundura, from which a small nulla issues and runs through a patch of verdant bushes: water was expected to be found here, but every pool was dry, and we had to continue our journey. A low range commenced near here, which at a mile to the westward formed a small valley. Another 5 miles brought us to a second clump of bushes, near a nulla called Madera Dubba; no water was to be found; but, having marched 15½ miles, and the heat becoming oppressive, we pitched our camp. In the evening the sky clouded over, and we had several very heavy and most welcome showers, with much lightning.

5th.—Sultulli, 17 miles, S.S.W., 8 hours. Road good; water none; forage scarce.

Started at 3 A.M., and passed in a S.S.W. direction, the valley after 2 miles opening into the plain of Eyroluf. At the 7th mile came to a small black lava hill, at the entrance of Wadi Kudaiti; it is the termination of a long low range extending to the Afraba Mountains, which were dimly seen to the S.S.W. From this hill we had an extensive view over the surrounding country, which bore a most interesting volcanic character; to the westward was the lofty volcano of Abida, about 4000 feet in elevation, having a very extensive crater opening to the N.W., behind which was seen the higher peak of Aiullo (?), partly hid by clouds, and at their base numerous smaller cones scattered irregularly over the plain; to the S.E. the Kudaiti valley was seen winding to the distant mountains of the Galla country. Continuing our course, we crossed a deep dry nulla, bordered with a green bushy jungle, in which we saw a hog and some guinea and spur fowl, and a few quail were found in the surrounding grass. Passing over a fine open grassy plain, at the 11th mile we came to a few stone sheep-pens. At 13th mile reached a singular conical hill, called Jebel Helmund, towards which our course had been directed since leaving Madera Dubba: it proved to be a volcanic cone, about 400 feet in height, the crater opening to the N.E., its base being surrounded by a belt of black rugged lava, forming a wall from

15 to 20 feet high, the crevices of which abounded with guinea-fowl. Passing round the lava left to the eastward, we came in sight of a most remarkable plain, apparently extending to the base of Jebel Abida. It was entirely covered with low shrubs, giving it a peculiar pale green tint, much resembling a lake covered with duckweed. During the greatest part of the year it is a sheet of water; and our guides here expected to find a supply, but were disappointed, and we were doomed to rest contented with the nauseous contents of the skins filled at Meinhatolli. Crossing for a mile, we encamped at Sultulli, near the foot of the low range of hills to the eastward.

The country in this neighbourhood is of a most interesting character, the lofty mountains of Abida and Aiullo (?) forming the centre of an extensive volcanic tract, from which sheets of lava have descended on all sides to the plain, forming a field of volcanic matter about 30 miles in diameter, studded with small cones, each showing an extinct crater, of which I counted as many as twenty-one from one point of view. The surface of the lava appeared fresh and glossy; but we could not learn that any tradition existed amongst the tribes in the neighbourhood of their having been in an active state. Heavy rain at night set in at 9 P.M.

6th.—Murro, 13 miles, W.S.W., 5½ hours. Road good; a small lake of excellent water; forage rather scarce.

The tents and baggage had become so wet and heavy from last night's rain, that we were not able to start before noon. Having proceeded 3½ miles along the base of the Kumi range of hills (and passed within 2 miles of a small volcanic cone), we entered the plain of Mittur, a bare alluvial deposit resembling the Scinde Deserts, and arrived at a few babool trees of small height, but still almost the first vegetation exceeding a bush we had seen since leaving Tajurra. This point is called Ras Mittur; and here the two roads from Killele join. From this point the road strikes off from the hills, which continue in a south-south-westerly direction, to Jebel Afraba, and passes across the plain in a W.S.W. direction, having the edge of the lava field about 3 miles to the N., passing over a fine grassy plain, with but few stones. At 8½ miles from Sultuli came to a low black lava hill, near which a fine herd of milch camels were grazing; and, 2 miles beyond, reached a small group of about twenty Bedawi huts: from this point the lava plain trends away to the north-westward. At the 11th mile came to a small patch of jungle; passing through which we again came to the open plain, which was studded with flocks of sheep and goats; proceeding ½ a mile, we arrived at the small lake of Murro, which was about ¼ mile in diameter, and surrounded by low stony hills. The water was very clear and good, but the lake apparently of no great depth, its centre being full of

leafless bushes, and its surface covered with wild-duck and several varieties of water-fowl. Cool pleasant day, with heavy rain at night.

7th.—Mullu Sugere, 13 miles, W.S.W., 6 hours. Road good; water in nulla; forage plentiful.

Started at 11 A.M.; the road passing in a W.S.W. direction across the Mullu plain, which is here about 20 miles broad, bounded to the N.W. by the Berdude range, and to the S.E. by the Kumi hills; it is a fine level tract, covered with grass, and studded with a variety of verdant bushes, with occasionally a fine cedar-like camel-thorn acacia. The scenery was very fine when, through an open glade, the view was extended to the blue peaked mountains near Afraba. The plain abounded with game, several varieties of antelope, some fine beizee, guinea-fowl, spur-fowl, hares, quail, bustard, and florican. At the 12th mile we came to some small muddy brooks, running to the northward, which the water had just reached from the Afraba hills. Our guides said that in a few days later the plains in this part would become a perfect swamp, nearly impassable for camels. Passing a fine green patch of grass, and proceeding another mile, we halted on a fine open spot near a large termites' nest. This camp was called Mullu Sugere, to distinguish it from a halting-ground more to the S. called Mullu, situated on the same water-course. No rain at night.

8th.—Berdude, 9 miles, W.S.W., 4 hours. Road good; water abundant; forage abundant.

Started at ½ past 4 A.M., and proceeded W.S.W. in the direction of a small barn-shaped hill, situated at the termination of the Berdude range. At the 3rd mile crossed the bed of a small stream; and at the 6th mile came to a group of graves enclosed in a thorn fence; and shortly after reached the barn-hill, passing which we came to the grave of Sheik Othban (?), a spot much revered by our Bedawi escort. Proceeding 2 miles further, we arrived at some fine pools of excellent water in the Berdude wadi, near some picturesque camel-thorns, and encamped on a rising ground above. From this station the mountain-range of Abyssinia was very distinct to the westward. Therm. at sunrise 68°; at 3 P.M. in a tent, 105°. Day cloudy, but no rain at night.

9th.—How, 15 miles, S.W. and E., 6½ hours. Road good; water, none; forage excellent.

Started at 5 A.M.; passed over low hills for 1½ mile, and then descended into the Halakdiggi Kebir plain, a continuation of the Mullu, but extending round the western sides of Jebel Aiullo (?) and Afraba. The plain is an alluvial level covered with grass, and, having but a thin sprinkling of scrubby bushes, without trees; crossed it for about 11 miles, passing a few antelopes and beizees,

and a herd of zebra; and our camel-men killed a leopard with their spears: we then came to a sloping bank of about 30 feet, and descended into a hollow called the Halakdiggi Sugere, about 2½ miles broad, its surface perfectly level, and covered with fine grass, and bounded by a similar bank on the western side. It ran N. and S. as far as the eye could reach, and had every appearance of having formerly been the bed of a considerable river. One of our guides called this valley the Hawash Kebir (large Hawash), but had no tradition accounting for the name.

We here saw a herd of wild asses. Crossing the plain, we ascended its western bank, and passed over three several terraces, each rising about 50 feet, and descended from the last into a confined valley, called How, where we encamped. The hills composing this part are of wacke formation, and passing in northerly and southerly direction from the eastern boundary to the valley of the Hawash, across which we had a fine view from the summit of a neighbouring hill: we could not see the river, but its course could plainly be traced by the belt of trees on its banks, beyond which appeared an open country but thinly wooded, extending to the foot of the Abyssinian mountains. Heavy rain at night, with thunder and lightning. Lat. of How, 9° 39′ 13″ N.

10*th.*—Hawash River, 11 miles, S.W., 4 hours. Road good; water abundant and clear, from lake; forage abundant.

Started at 6 A.M., and descended the face of the hill in a S.S.W. direction, passing for 3 miles over several terrace plains; we then reached the level of the valley of the Hawash, which we crossed to the S.W. ½ W. for 6 miles, the latter part of the road being very winding, from the thickness of the jungle.

As we approached the stream the country became thickly wooded with a variety of timber trees, but none of any great size; amongst them were some fine specimens of the camel-thorn. On the ground we found marks of the rhinoceros and elephant; the dung of the latter was very plentiful, and the shattered branches of the trees bore evidence to their visits. After a march of 11 miles we encamped near a low hill on the banks of the river, 2223 feet above the level of the sea. With the Hawash itself we were much disappointed; its breadth did not exceed 40 or 50 yards, and its muddy stream, which ran at the rate of 3 miles an hour, was about 10 to 12 feet deep: its banks were about 20 feet above the surface of the stream; and our guides stated that after heavy rains the level country on either side is overflowed for miles. Near our camp the river took a semi-circular curve, but its general course appeared to be N. and S. from the mountainous regions of the Galla, flowing to the northward, and taking its course to the W. of Jebel Abida. From all the accounts we received, it terminates in an extensive lake near Aussa, most probably interrupted

in its course to the Bahr Assal and Bay of Tajurra, at the same period that volcanic action separated the waters of the salt-lake from Gubbat-el-Kheráb.

11th.—This day was occupied in transporting the baggage and camels to the opposite bank. The loads were placed on rafts, constructed from the drift timber found on the shore, under which from twelve to twenty inflated water-skins were lashed, rendering the whole very buoyant. The transit of these rafts was facilitated by means of a rope passed from bank to bank. On crossing the river we visited a small lake of clear water about ¼ mile from it; this lake was about 600 yards in its longer diameter, and contained a number of hippopotami and crocodiles, which were continually rising to the surface of the water to breathe.

12th.—Assaboti. 12½ miles W. by N., 5½ hours. Road good; water in nulla; forage none.

Started at 6 A.M., and passed round the northern end of the Hippopotamus Lake, near the village of Melkukun, and after traversing a mile of hilly and stony country, came to the circular lake of Hulabulu (?), prettily situated in a green hollow, with precipitous sloping banks, apparently the site of an extinct crater. Its waters were of a sulphurous and saline nature, and are in great repute with the natives for their cleansing and bleaching qualities. The road then passed over small grassy plains, shut in by conical hills of no great elevation, but of a decided volcanic character, the craters of some of them being very apparent. The neighbouring rocks, wherever they showed above the soil, were of black lava, which appeared to extend over a surface about 8 miles in diameter. At the 8th mile the lake of Le-adu came in sight, situated on the plain, and about 1 mile to the southward. Striking off the road, we proceeded to its banks; it is a pretty lake of good water, about 2 miles in diameter, bordered with a dense jungle, the resort of elephants; its margin covered with the lotus-plant, and teeming with geese, ducks, and other aquatic fowl. There was a small cluster of huts near the lake, and the women were driving down their flocks of sheep and goats as we approached; returning to the road, we passed over a bare open plain without grass for 3 or more miles, when we came to two small stone enclosures, in which from poles were suspended as trophies the stuffed heads of two lions slain in the neighbourhood some years ago; then passing a small group of huts, we at length, after a march of 12½ miles, reached the wadi at Assaboti, in which we found a plentiful supply of water; but very little grass could be found in the neighbourhood for our cattle. From this station we had a fine view of the lofty mountains of Abyssinia, rising range beyond range, and canopied with clouds. At night had very heavy rain.

13th.—Dathura in Wadi Kokai, 12½ miles W. by N., 5½

hours. Road hilly; water good and plentiful; forage abundant.

Fine cool morning; started at ½-past 6 A.M., passed for 6 miles over the Assaboti plain, which as yesterday was nearly destitute of vegetation, and but thinly wooded, the wide-spreading camel-thorn acacia forming the most striking object in the scene; passed for a short distance along a bend of the Assaboti Wadi, and, soon after, the hilly country at the foot of the Habesh range commenced near a halting-ground called Atkonsi. Our road now passed over hill and dale, thickly wooded, with a great variety of trees, the camel-thorn, babool, and tamarind being most frequent, whilst the under surface was completely covered with the socotrine aloe-plant, which here grows most luxuriantly, and might be rendered a valuable article of commerce. At the 10th mile we came to the pebbly bed of a mountain-stream called the Wadi Kokai, running to the eastward towards the Hawásh; our road for 2 miles now passed either along its banks or through its bed, where, notwithstanding last night's heavy rain, we found no water; at times passing through narrow ravines shut in by precipitous rocks, emerging from one of which we entered on the small open space called Dathura, where we encamped, and in the bed of the stream found abundance of clear crystal water. By the boiling-point of water the height of this station above the level of the sea was found to be 2944 feet. We were here visited by the Walasma Mahomed, governor of the Mussulman provinces in the lower country, the first Abyssinian potentate we have met.

14*th*.—Halted.

15*th*.—Dinomali, 5 miles W. by N., 2 hours. Road hilly; water abundant; forage rather scarce.

Started at ½-past 6, escorted by the Walasma Mahomed and about 200 of his people, the road gradually ascending and passing over a hilly and wooded country abounding with the aloe-plant, and having deep valleys opening to the N. and S. At the 5th mile came to the first cultivated ground, and shortly afterwards encamped on a small open space called Dinomali, where the duties on articles arriving by the Adal kafilas are levied; during this day's march we ascended considerably, but the climate still continues very hot.

16*th*.—Ferri, 2 miles W., 1 hour. Road good; water abundant, but distant; forage very scarce.

Crossed a hilly tract, with occasional patches of cultivation for 2 miles to Ferri, the first village we have seen since leaving Tajurra. The houses were of a circular form, with conical roofs, and perched generally on the sides and summits of the surrounding hills; our tent was pitched on a small open space below,

where we spent a very hot day, much inconvenienced by the numerous visitors curiosity brought to the spot.

17th.—Aliu amba, 13 miles S.W., 6 hours. Road mountainous; water good and abundant; forage very scarce.

Started for Aliu amba escorted by a party of 200 matchlock-men under Aytu Katama, our baggage being carried by porters, the road being too mountainous for camels. We first passed over a low point to the S. of Ferri, and then along a valley winding to the S.W., the road at times running along the precipitous sides of its hills, and then descending into the bed of a fine mountain-torrent at their foot; the aspect of the country becoming most verdant and extensively cultivated, small villages being perched on most of the numerous peaked hills we passed. At the 5th mile passed through a gap in the range extending from Gucho, leaving the village of Aigibba on the summit of a high hill to the E., the first Christian village in Iffat, and the spot where the late Mr. Airston was interred. We then entered a triangular district immediately below Ankóbar, bounded to the N. by the rugged spur projecting from the lofty peak of Ememaret (the Mother of Grace), to the S. by a range commencing at the projecting peak of Losa, the base between the two points being about 10 miles. The road winding to the S.W. passes over a mountainous tract, traversing valleys and successive ranges of hills, and crossing the beds of two mountain-streams, the country highly cultivated, and each rounded hill being crowned with a small cluster of cottages. The vegetation was most luxuriant, approaching in character to that of Europe. After an interesting march of 13 miles, we reached Aliu amba, a large straggling village built near the extremity of a spur from the range near Ankóbar, having a small stream running through the valley at its foot. By thermometrical observations it was determined to be 5271 feet above the level of the sea. Aliu amba is inhabited chiefly by the Mahomedans, and is the principal mart for slaves to which the Danákil dealers resort, an extensive market being held here every Friday.

On our arrival we were lodged in a wretched, barn-like house, and were detained here until the 1st of August, when the mission proceeded to meet the king of Shwá.

August 4th.—Ankóbar, 6 miles westerly, 2 hours. Road mountainous and steep; water abundant and good; forage scarce.

The road from Aliu amba to the capital winds to the westward, with a very steep ascent in parts, for about 6 miles to the summit of the high range of mountains which run from N. to S. Ankóbar is built on two wooded hills; the northern one strongly palisaded, being exclusively occupied by the residence of the king and its numerous out-buildings; the southern thickly clustered with houses, forming the capital of the kingdom of Shwa. Ankóbar,

by the means of Lieutenant Barker's observations, was determined to be in lat. 9° 34′ 33″ N., and by the protracted route is placed in long. 39° 35′ E. The boiling-point of the thermometer gives an elevation above the level of the sea of 8198 feet, corroborated by the mildness of the climate, the thermometer during August and September never having risen above 63°, and 46° having been the minimum.

Total—days' marches, 36; miles, 372; hours, 174.

VIII.—*Extract Report on the probable Geographical Position of Harrar; with some Information relative to the various Tribes in the Vicinity.* By Lieutenant W. C. BARKER, I.N., *attached to the Mission to Schwá.*

SHORTLY after our arrival at Tajurra, a subject of the king of Shwá, Romeat Ullah by name, anxious to return to his native country, accompanied the mission as a horse-keeper. He gave me the following account of Harrar, together with a narrative of his journey thither, and thence to Zeïlah, which I relate in his own words.

"I am a native of Guburuah, a village situated about 2 miles to the N.E. of Aliu amba. About seven years ago I left my native country with a kafila of about 200 asses, these animals being used in preference to camels. The people of the kafila were principally natives of Harrar: they had many slaves with them.

"We quitted Kuldas, a village about 14 miles to eastward of Ankóber (whither the Harrar kafila always resort), in the month of June. At the end of the second day's march we arrived at the banks of the Hawásh; crossing which we filled our water-skins, and proceeded two days without finding water. On the morning of the third day we came to a watering-place called Sirke or Sirge, where there are hot-springs. The third day after quitting these springs we arrived at Errur, situated in a place at the foot of the Galla hills, where there is a wadi with excellent water."

The road thus far he described as passing through an uncultivated country, inhabited by wandering tribes of the Adáil, who subsist by plunder;—woe to the unfortunate straggler in these parts, for he is sure to be cut off. The Adáil in general bear anything but a good character; they are described as being exceedingly ferocious and bloodthirsty. For fear of them the kafila made two marches, daily, or about 15 miles, until it arrived at Errur.

Errur is a place much resorted to by the surrounding tribes,

especially in the dry season. To the N. dwells the tribe of the Gurgurah, who are Mahomedans, and subject to the Essah Somauli; to the S. dwells the tribe of Argubah Galla; and to the E. the Nuli and Alla Galla—the former occupying the N. and the latter the S. side of the road to Harrar.

The Galla are generally pagans; there are, however, some few Mahomedans among them. From Errur to Harrar the road is over stony ground, tolerably level; guns might be conveyed by this road on their carriages. To continue the narrative of my informant:—

"On the morning of the fifth day after quitting Errur we arrived at Harrar, having travelled by daily marches of about 10 miles. We had water at each halting place; and the people we met with were very civil.

"I remained at Harrar and in the vicinity thereof for six years, during which period there were several battles fought between the Harrar people and the Galla, in one of which I was engaged on the part of the Emir, and received a spear-wound in my right cheek.

"Having determined to perform the hadj, I quitted Harrar with a kafila proceeding to Zeïlah. The goods of the merchants and our baggage being carried on asses, we travelled slowly (for it was the hot season), marching about three hours, or 7 or 8 miles each day. We frequently had to carry water with us for two days. On the 20th day we arrived at Zeïlah: thence I proceeded to Mecca; and, having performed the hadj, returned to Tajurah, intending to proceed to my native country through that of the Danákil.

"The Danákil tell you that the Essahaad Galla are thieves and murderers—do not believe them; I have seen them, and can therefore judge: the Danákil are bad people, and that you know.

"Having a little money, I shall become a trader; but God forbid I should ever pass through the country of the Danákil to Tajurrah.

"Inshúllah after the Ramadan. I shall go to Zeïlah by way of Harrar."

From Romcat Ullah's narrative the town of Harrar appears to be situated about 192 miles E. of Ankóber, and about 150 miles S.S.W. of Zeïlah, in a verdant valley almost encircled by hills. It has a wall round it built of stone and mud, which is kept in good repair; its height is about 12 feet, and the thickness 3 feet, and in circumference 2 hours' quick marching.

There are five gates, viz. Esma-din-burri—by this gate the Habesh kafila enters and departs; Suktal-burri, for the Arrusie kafila; Buddaru-burri, towards the Alla Galla; Argobah-burri, by which the Berbera kafila enters and departs; and Assum-burri, for the Zeïlah kafila.

The Galla approach close to the town on the N. To the N.W. dwell the Nuli Galla; to the S. the Alla Galla—these two are very powerful tribes, mostly pagans; to the N.E. dwell the tribe of Giri Galla, who are Mahomedans; and to the S.E., towards Berbera, the tribes of the Jarsu, Babil, Bursub, Burtiah, and Gotti Galla—many of whom are also Mahomedans.

The houses of the Harrari are genearlly built of stone, and whitewashed, with flat roofs. There are, however, some few huts resembling those of Shwá. The emír and a few of the principal people have houses of two stories. There are many mosques, the principal of which is called El-Jamah: it has two tall minarets. The town is well supplied with water from numerous springs in its vicinity; there are no wells or springs within the walls.

The ruler of Harrar governs with the title of emír; the name of the present emír is Abu Bekr. The succession is hereditary. As is the case in Shwá, the male relatives of the reigning prince are said to be all confined in vaults, from which they are seldom allowed to emerge. Should the emír, however, at any time need their services, they are released, and frequently preferred to situations of great trust; but on the slightest suspicion that they are plotting against the government, or should they become too popular, they are speedily sent back to their vaults again.

The military force of Harrar is very small, consisting of from 150 to 200 matchlock men, 100 cavalry armed with long spears, 60 spearmen on foot, and a few archers. Insignificant, however, as this force really is, the matchlockmen alone render it far superior to that of the neighbouring tribes, who have a great dread of fire-arms; they have not even a single matchlock in their possession. The Galla are, however, said to be good horsemen, and frequently manage to surprise the Harrari when least expected: they have never, however, been able to enter the town; indeed, so great is their dread of the matchlockmen, they have never ventured to attack it. They do much mischief by carrying off the crops about harvest time (for the country for miles round is said to be highly cultivated by the Harrari) and by robbing the kafilas, for which it is said the emír retaliates severely by burning and destroying their villages.

In time of peace the Galla, before being permitted to enter the town, have all their arms but their jambir or cresi taken from them, which are lodged with the emír until they depart, and are then restored to them. The same practice prevails at Zeïla with regard to the Essah Somauli.

Of the number of the population I could obtain no account; it must, however, be great, as the houses are said to be built very close together. The principal occupation of the people is that of

tilling the soil, which for several miles around is highly cultivated, producing coffee, wheat, jowari, barley, &c.; they also have a variety of fruits and vegetables. The *kaat* (a small plant, the leaves of which are said to possess an intoxicating quality, and of which the Arabs in Yemen, where it is also found, are exceedingly fond) is said to abound in great quantities. The ground is irrigated by artificial means from numerous springs or fountains, as my informant called them.

Coffee is the most important article produced; at least 2000 bales are yearly exported to the sea-coast, to the ports of Berbera and Zeïla, and thence to Arabia and India; finally to the European markets, where it is sold as Mocha coffee.

Besides tilling the ground the men have but little occupation; the women, as in other Eastern countries, performing all the household work; there are, however, weavers, blacksmiths, and gold and silver smiths.

The dress of the inhabitants is similar to that of the inhabitants of Shwá, consisting of one long cotton cloth wound round the body and over the left shoulder; it is generally ornamented with a red border. None but hajis, and the emír and his family, with a few of the principal people, are permitted to wear turbans, the rest go bareheaded; all wear sandals, except the women. The emír dresses after the custom of the Arabs; he generally wears silk.

German crowns are current, but not plentiful, trade being generally carried on by barter. There is a small copper coin, called mahaluk, twenty-two of which are equal to a nominal coin called ashufie, forty of which latter are equal to one German crown. The mahaluk resembles the dewanni of Jidda; on the one side is inscribed in Arabic characters *La-illah il Ullah,* and on the reverse the name of the reigning prince.

Harrar may certainly be considered, for that region, a great commercial town. Kafilas are arriving from, or departing to, various quarters at all seasons: the principal are those which trade to Berbera, Zeïla, Shorah Chercher, and Arusie: there are also smaller kafilas that trade to Amin, Ugadin, and other parts of the Somauli country.

There are three kafilas that depart yearly for Berbera between the months of October and March, occupying from 30 to 40 days on the road. Camels are used in this journey laden with coffee, jowari, ghee, ostrich feathers, &c.: they have also an article called wurs in Arabia, which was described to me as somewhat like saffron in appearance: it is used by the Arabs as an ointment for cooling the body; it is also mixed with flour and made up into cakes, which are said to be very palatable. They export also to Berbera slaves, both male and female, and large quantities of gum and myrrh.

In return they receive blue and white coarse cloths, Indian piece goods, European prints, silks, silk thread, shawls, red cotton yarn called shumlah, beads, zinc, copper wire, frankincense, and Murgut or Bokhur somúli (?).

The March kafila is the principal one. I was in Berbera in March, 1841, when it arrived: it consisted of about 2000 camels. I was informed subsequently that these did not all belong to Harrar, but that several of the smaller kafilas had joined company on the road.

There are three kafilas to Zeïla yearly; the articles of export and import being much the same as to and from Berbera. In addition, they also export to Zeïlah millet, wheat, beans, &c. &c.

Smaller kafilas trade almost monthly to Shwá, except during the rainy season. In former times a large kafila, called the Ebu, used to travel yearly, consisting of about 600 asses; but since the accession of the present emír the country has been in too unsettled a state to permit such a risk of property. I was given to understand that the kafilas at present go by stealth, as the emír is averse to their passing through the country of the Galla; but, as they generally return successful, nothing is said to them.

While we were residing at Ankóber, about the middle of August, a small party arrived from Harrar, with letters from the emír to Saheli Selasse. It is said these letters were requesting the assistance of his majesty "to keep the road clear." They set off on the 6th of September with the king's answer (which was said to have been favourable), and also with presents from him for the several chieftains on the road. They returned on the 11th, having lost the letters in attempting to cross the Hawásh: the party consisted of about ten men.

The exports from Harrar to Shwá are chiefly coarse blue cloth, red cotton yarns, &c.; in return they receive slaves, mules, horses, &c.

With the Arusie Galla the people of Harrar have also considerable trade. My informant resided there for five months. It is situated 10 days from a kafila, to S.W. of Harrar. Arusie is a large town, or rather encampment of the Galla, whither the several tribes resort, each governed by its own chieftain.

Between Arusie and Harrar, and at 3 days' journey from the former, flows the river Wábi, which is said to be as large as the Hawásh; its course runs to the S.E., through the country of the Somauli, towards the sea-coast.

Mr. Krapf kindly furnished me with the following information relative to this river, which he obtained from a native of Gurague, who says that there is a district called Wahbi, between his native village Ariuellelle and Dauro, where a river rises which has the name of the district. This river flows to the eastward through

the Galla tribe of Maroko; and then on the side of the Arusie Galla, another river, called Korki from the name of the district, also rises in the country of the Koortab near the lake Suai: this river, joined with another called Koka, falls into the Bohaia, with which the Wábi joins on the eastern side of Arusie. The farther course of the river is unknown, but it is certain that it does not join the Hawásh.

The articles of export to Arusie are beads, copper wire, blue and white cotton cloths, &c., for which they receive cattle principally, also kurabi and wurs.

Chercher is situated in the Galla country, 6 days' journey to S.E. of Ankóber, and days' journey from Harrar. The articles both of export and import are the same as Arusie.

The Harrari are rigid Mahomedans, paying strict attention to the fasts and ceremonies enjoined by that religion. There are said to be many mosques within the town, forty-four of which are the abode of oulieh (saints?), the chief of whom is called Alkadir. They are supposed to be the invisible defenders, not only of the town, but also to accompany the people in their expeditions against the Galla.

Were one to doubt their existence, the reply immediately is "How could we so long not only have *withstood*, but triumphed over the numerous forces of the Galla, had we not been assisted by the oulieh!"

Although the language of the Harrari bears an affinity to the Amharic, yet it is said they use the Arabic character in their writings. This, indeed, is not unlikely, as it is a common custom for the Mahomedans of Shwá to write the Amharic language in that character.

The climate is said to be similar to that of the Shwá, but not quite so cold.

There are no duties on exports, and even on imports the duty is but trifling, for one ass-load of cloth the duty is one tobe or dress, such as is generally worn by the people, consisting of about 30 cubits of white cotton cloth, which is generally one cubit wide. Three widths of 10 cubits thus form a dress.

For slaves they pay a duty of one frazil, or 28 pounds weight of zinc, which at Harrar is considered equivalent to two German crowns. I could not ascertain the number of slaves imported yearly, but it is no doubt considerable.

While at Ankóber I had an opportunity of confirming the account given above of the route from Shwá to Harrar, and thence to Zeïla; for I met there with one Mahomed Said, of the tribe of the Myerteyn Somauli, who inhabit the coast to the eastward of Berbera. This man travelled from Zeïla to Harrar, just after the hot season, on the coast. The following are the names

of the mahalla or halting-places: — Tacushah, Dohowanah, Wunabilli, Kurbutti, Dahbelli, Dahinanah, Elungirah, Elan, Jiggigir, Dullanulli, Amarah, Kuti, Artu, Jild Essah, Ballow Harrar.

The two last halting-places are in the country of the Nuli Galla, the former that of the Essah Somáli. At this season he found water at each halting-place. A messenger could perform this journey, he informed me, in six or seven days. He quitted Harrar on the first day of last Ramadan (28th October, 1840), and arrived at Kuldas on the 15th. The following are the names of the halting-places:—Jild Essah, Ursu, Sahbullow, Errur, Mulu, Dunharka, Billun, banks of the Hawash, Oak-belie, Jahibulla, Asuka, Kuldas—in all twelve halting-places. A messenger on a mule could perform this journey in 8 days. As this was after the rains in the interior, they had no want of water, but found it plentifully at each halting-place.

It would appear from this statement that a messenger from the frontier village Kuldas could reach Zeila by way of Harrar in 15 days, and by a direct route through the country of the Somauli probably in 12 or 13 days.

A kafila could perform the journey in 27 days; but it is a common custom to halt at certain places for a few days to dispose of their merchandize to the Bedawi. It must be borne in mind, that on this route there is no ascending 1400 or 1500 feet above the sea to descend 600 feet below its level; or, in a word, there is no Bahr-asal: indeed, through the greater part of the route, I was informed, guns could be transported on their carriages.

Experience has shown that implicit reliance cannot be placed on information gained merely from native traders. I am inclined, however, to place much reliance on the information given me by Romeat Ullah. His route from Harrar to Kuldas is confirmed not only by Mahomed Said, but also by the arrival of the messengers from the emír to Saheli Selasse. And as Romeat Ullah has offered to accompany me after the Ramadan, I do not think he would run the risk of being exposed by giving wrong information.

The foregoing account is from notes made at various times. I find, on referring to my journal of November, 1840, that from information obtained at Zeïlah—"Harrar is said to be situated to the S.W. of this port, a journey of 15 or 20 days for a kafila, or a 7 days' journey for a messenger. The kafilas, however, loiter on the road, and frequently dispose of their goods to the Essah, who are said to be scattered about the country. Harrar is said to be a large town surrounded by a wall: the inhabitants have no guns, but plenty of matchlocks." So that my informant's account of this part of the route also may be said to be confirmed.

IX.—*Route from Ankóber to Díma.* By Dr. Beke. Communicated by the African Civilization Society.

Díma, 15th December, 1841.

It was not till the morning of the 19th of October that I quitted Angolalla. The point first to be made by me was Angórcha, in the country of the Abba Moale, a powerful Galla chieftain, whose possessions extend nearly, if not quite, to the Abaï; and there I was to remain till his return from accompanying the Negús on an expedition, on which he had set out only the day before my departure; after which he was to see to my crossing the Abaï in safety.

My road lay across the meadows to the W. of the capital as far as the village of Fácho, where the small stream of the same name is crossed, shortly above its junction with the Chácha. This latter river is also soon crossed, as well as another tributary called the Kalla Chácha. The country about these rivers is rocky, it being in the immediate vicinity of the point where they fall precipitously several hundred feet into a ravine which continues far north-westward, and which would appear to close the level country in that direction. After passing these rivers the road continues for some time north-westward along the side of this ravine, passing Cherkos, as well as numerous other villages situated in a beautiful fertile country, slightly undulating and adorned with trees. This country was formerly conquered and taken possession of by the tribe of Abichu Gallas, who still continue to occupy it; but they are at present Christians and the peaceable subjects of the Negús. Subsequently the district of Wáin is entered, occupied by the tribe of Gelán Gallas, now also subjected, possessing numerous villages in a rich country. The Governor of this district is Aito Wokísa, at whose house, situated on a slight eminence, I passed the night. There is very little state about this Governor, who is, I apprehend, little more than a farmer of the Negús's.

Oct. 20th.—Quitting Aito Wokísa's house, the road continues for some little distance N.W. through the district of Wáin, and then again approaches the ravine, after which it takes a more westerly direction through the district of Djírru, the country becoming flatter, less fertile, and without villages or trees, but affording pasture to numerous herds. This is a portion of the ancient province of Shwá Miéda, which stretches to some distance to the S. In the district of Enarí (forming part of the province), which we subsequently entered, the plain narrows between the valley of the river Bersena and that of the Adabái (which latter river is formed by the junction of the Chácha with the Beresa), and at length it ends in a point across which a stockade is thrown,

at the gate of which travellers are stopped till the Governor's permission is obtained for their passage. Upon the admission their road passes round to the right within this stockade, but outside of an inner one, descending almost perpendicularly down abrupt basaltic rocks, by a narrow path impracticable for beasts of burthen. My luggage had, consequently, to be unloaded at the outer gate, and carried on men's backs to near the bottom of this pass, where it was reloaded. After descending a cross valley, between the two principal ones, which is, however, far from attaining their depth, the road winds round to the left and up a separate mass of rock of considerable extent, forming the Amba, or Hill-fort of Dey, the residence of Aito Bisáner, the Governor of the province of Morat, which name the country bears from the point where the descent from Shwá Miéda begins. On reaching the top of the Amba one finds oneself on a level of sufficient extent to contain a tolerably large village of the Governor's retainers, reaching on the west side to the Church of St. George, after which the ground begins to fall. The elevation of Dey, which is merely a continuation of the plateau of Shwá Miéda, I found to be 7887 feet, being only between 600 and 700 feet lower than Angolalla. The fortress of Dey is a very important station, situated as it is at the junction of the Adabaï and Bersena, and being thus the key to the high plain country to the W., at the same time that it commands the mountainous country below it in the opposite direction. There are only three roads by which it is at all accessible, and only one of these is practicable for beasts of burthen, the other two being through mere fissures in the rock, by which only one person can pass at a time. Aito Bisáner was not at home, being with the Negús; but I was extremely well received by his lady, although, according to etiquette, she was not visible during her husband's absence.

22nd.—I did not leave Dey till this morning. The road at first went, for some little distance, past the Church of St. George, most delightfully situated on a level and smooth plot of grass studded with cypresses, and commanding an extensive view over the valleys to the N. and S. The baggage-horses having to make a long circuit round the Amba, I remained seated here for upwards of an hour, when, seeing them below, I descended by a chasm in the rock still worse than that by Enarí, to the large village or town of Debra Beserat, belonging to the monastery of Siena Markos, a celebrated Abyssinian Saint, which is situated at the extreme E. of the village. Before us in a direction nearly W. lay the Amba of Yáwalo, at a much lower elevation, and to this our course was now directed by a very circuitous, and, at times, difficult road, always descending. At some distance down we came to a view of the river Bersena, running in a steep valley

to join the Jámma. It rises in the country of the Abichu Gallas, and, in the lower part of its course, divides the province of Ensarro from that of Morát. After considerable delay, on account of the difficult nature of the road, it at length got very level, and, about noon, we arrived at a small stream running E. and then northward to the Jámma; shortly after which I was met by a venerable old priest, who entreated me to put up at his house close by, for the purpose of prescribing for his sick daughter. I could not resist his earnest entreaties, and therefore, instead of continuing my course down to the valley, I turned towards Yáwalo, ascending the Amba some little way, on the N. side of which the priest's house is placed, commanding a pleasing view of the Jámma flowing from E. to W., with the province of Morabiáte beyond it.

23*rd.*—This morning we continued the descent of the mountains, approaching the junction of the Jámma (Adabaï) and Bersena, which was visible in about ½ an hour, just after passing the village of Kolena, close to a small torrent running to the former river. The point of the mountain is now turned, and the road continues nearly W., descending towards the Bersena, very steep and winding. By degrees it gets rather more level, and at length turns southward to the river, which we reached at ½ past 10 o'clock. Its stony bed is about 100 feet broad, but now dry, with the exception of a small stream scarcely 2 feet wide, running briskly in a direction about N.W. A patch of jungle about 200 yards wide separates this branch of the river from another somewhat broader, but which was quite dry. After leaving the river, our course lay through a low country, partly jungle, but chiefly cultivated, bearing crops of pulse, tobacco, cotton, maize, &c. The district to the S. of the Bersena, called Ensarro, is under the government of Aito Merrit, to whose residence we now proceeded. The country, which at first is flat, soon gets mountainous, and the mountains appear all to drop towards the junction of the Bersena with the Jámma, with the former of which rivers all the streams and ravines communicate, where it meets with the latter. In the course of the first hour from the Bersena, the stony dry beds of two other streams are crossed, after which the road ascends a gorge in the mountains, and, after passing the village of Déraka, it becomes more level, continuing below a mass of basaltic rock to the left, which rises abruptly from the sort of plain on which we were, in a lengthened terrace, towards the point of which we proceeded. In about an hour we began a very steep ascent westward up the face of this terrace, and, when just at the summit, turned round sharp to Wála, the residence of the Governor, situated at the extreme point. Aito Merrit was, like Aito Bisáner, absent; but the reception I met with from his wife,

Aito Shishigus' daughter, afforded a highly favourable specimen of Abyssinian hospitality. She also was not visible, but her servants, who were in attendance on me at all hours, reported to her my slightest wants, which were instantly satisfied. A few trifling presents were received by this lady, as if I were conferring a great obligation on her for which she could not show herself sufficiently grateful.

25th.—We remained at Wála until this morning, and, on leaving, proceeded on foot to the torrent Kersa; which, below where we passed it, continues its course northward far beneath us to the right. From thence, the road lay over level ground, a lower terrace being to our left, whilst another descended below us on the right. In about ½ an hour we reached the river Bon with which the Kersa unites, as does also another small stream from the opposite side: the Bon then continues its course to the Jámma. The country of Ensarro, of which we had an extensive view, lies far below, and its numerous villages demonstrate its fertility and large population. The inhabitants, as well as those of Morat, are all Abyssinians, the Gallas having now penetrated into these countries. After passing several small currents, all of which proceed to the Bon, our road turned round N. from the watershed by the steep winding path to the river Yémme, which has its course to the Ziéga Wódain. From thence the road continues more gradually descending towards the last-named river, in great part through a tolerably thick jungle of acacias. On reaching the steep bank a path leads down it, first N. and then S., to the bed of the stream, which is about 200 yards broad, with a bottom of stones and sand. The stream itself was now only 20 feet wide, and about 18 inches deep in the middle, running pretty rapidly on the southern side of the channel, which has a N.W. course to the Jámma, winding between bluffs of rock on either side. A small stream joins the Ziéga Wodain from the opposite side, just at the point where we crossed it, and to the N. of this we began ascending the mountains, which are not so precipitate as those on the side we had left. They appear farther up to be a system of ridges running out from the high table-land nearly parallel from S. to N. towards the Ziéga Wodain, with cross valleys between them communicating with that of that river. Angorcha, to which place our course was now directed, is situate on the summit of one of these ridges. After passing the village of Addisgói, which gives its name to the district below it as far as the river, we approached the ridge on which Angórilla is placed. At the top it is so narrow that a view is, at the same time, obtained on both sides, up the valley of the Ziéga Wodain to the left, and into that of Sáfa on the right. The celebrated monastery of Debra Líbanos, founded by the Abyssinian lawgiver and saint, Tékla

Háimanot, is situated on the rise of the land to the S. of the Ziéga Wodain, about 8 miles S.E. of Angórcha. Angórcha is a small village under the government of Aito Duriésa, a petty shum of Abba Moalle, and his house, placed at the upper part of the village, is defended by a stockade running across the ridge, which descends precipitously on both sides, and prevents farther access. I was told by Aito Duriésa, that many years back gold was discovered on the very summit of this mountain; this may be questioned, but I believe it is an ascertained fact that some of that metal has been found near Debra Libanos within the last few years. At Angórcha I remained until I heard of Abba Moalle's return to Gérrar, his paternal seat, whither I was directed to go to join him. Whilst at Angórcha the treatment I received was very different from that I met with at the houses of Aito Bisáner and Aito Merrit; not, I believe, from a want of inclination on the part of my host, but from his inability to do more for me. The vicinity of Angórcha is very mountainous and quite barren.

November 2nd.—Quitted Angórcha this morning, accompanied by Aito Dariésa and about a dozen attendants. Our road at first descended at the back of the mountain, and over the valley of the river Sáka; after which it took a S.W. direction, over gradually rising ground. The whole of the country here is very barren, producing little but aloes, stunted acacias, &c. The valley of the Yariafat, on the opposite side of Angórcha, now opened to our view, and the ground became more level, but still rising, showing at the same time some signs of cultivation. We soon passed a couple of small streams, which together form the Yariafat; after which we came to the high table-land which extends from the Abai, westward, to near Ankóber; and, after passing the large village of Doyo, we reached Gérrar, a small village situate on a rising ground, in a well cultivated district, at a short distance W.S.W. from Mount Salála. The dwelling of Abba Moalle is placed not at the highest, but towards the lowest part of the village, and is surmounted by a high wooden fence, within which is a low wall of dry stones. In his court this chief emulates the state of the Negús, having his dancers, singers, &c.; and his establishment (as far as my experience enables me to decide), although on a small scale, appears to be on a more liberal footing than that of his royal master, everything being in abundance, and supplied with an unsparing hand. The inhabitants of this place and its vicinity belong to the paternal tribe of Abba Moalle, the Saggó Gallas, who are now for the most part, if not entirely, converted to Christianity. In fact he is generally spoken of as the chief of Muger Salála; but this is not altogether correct. The Salála Gallas inhabit the mountain of that name; Muger is beyond it to the S.W. Gérrar is the paternal seat of Abba Moalle, but he

prefers as a residence Wogiddi, to which place I accompanied him on my way to Gojam.

4*th*.—This morning I left Gérrar for Wogiddi, in the company of Abba Moalle. The suite of this chief was similar to that of the Negús, and it was not on a very much smaller scale, so numerous were his attendants. The way now led north-westward, returning towards the valley of the Ziéga Wodain, which we had left on quitting Angórcha. The country through which we passed is more hilly than before; as, in fact, towards the W. the ground rises generally, and at length forms mountains of considerable elevation. After a tolerably brisk ride of about three hours we arrived at the Amba of Geira Maskala, where Abba Moalle is erecting a seat, which is now nearly finished. From thence the road lay more to the N., the country becoming more rough and mountainous as we descended towards Wogiddi. This is a considerable village, like Angórcha, situate on a ridge overlooking the river Jámma. The establishment of Abba Moalle at this place is on a much larger scale than at Gérrar, it being his principal residence. The dwelling of this prince is placed near the edge of a precipice, from whence an extensive view is obtained of the low country as far as the Abaï, the greater part, if not the whole of which is subject to him. He is very fond of sitting, in the morning and evening, when the sun is low, on the very brink of this precipice, enjoying the prospect of his dominions. On the evening of our arrival he sent for me to show me the prospect, with the mountains of Gojam; and more than once, subsequently, I met him at his favourite spot. The treatment I experienced from Abba Moalle was most kind and friendly. It is true I had to give him a musket, which had been supplied me by the British embassy at Ankóber, and a musical snuff-box (both of which I had intended for the ruler of Gojam), as also one of my single brace of pistols: but when it is considered that, without his good-will and protection, the road would have been utterly impracticable, and that, as far as he was concerned, he did everything for my safe conduct through this wild and hitherto unvisited country, the price paid him was certainly not too high. On my road thus far I had made frequent inquiries after the river *Anacheta*, which appears in our maps, but without success. At Wogiddi a scribe suggested that it must be the *Wánchit*, which joins the Jámma somewhere to the N. of Wogiddi, but does not rise in the vicinity of that place. Its position and course, as laid down in the maps, will therefore be tolerably correct.

10*th*.—I was detained at Wogiddi until to-day; at first on account of the decease of a near relative of Abba Moalle, who was killed by the Jarsa Gallas inhabiting the southern bank of the

Jámma, which occurrence prevented me from speaking to him about my departure; and subsequently to await the arrival of the Shum of Lélisa, Aito Galater, to whose care I was to be committed. He having arrived yesterday, I this morning started in company with him and an escort of three men. The road at first lay down the ridge of the mountain towards the Gómbel, a separate amba, where Abba Moalle's treasures are kept, which we left to our right as we descended. After a ride of about 2½ hours we reached the large stream Sielma, which gives its name to all the Galla tribes in its neighbourhood. This river, where we crossed it, is from 15 to 20 feet broad, in a channel of about three times that width, running rapidly, among stones, towards the Jámma. Soon after passing the Sielma, a small tributary, called the Káriso, is crossed. The road thus far is rough, but it afterwards gets more level through the district of Gurj, which commences at the Káriso. Another torrent, now dry, is soon after passed; after which the district of Aváso is entered, and in half an hour more the village of that name is reached. From thence the road goes through a beautiful country to Lélisa, the residence of my guide. The valleys in the immediate vicinity of the streams are deep and rough, and clothed with jungle; but the plain country between them, lying at the foot of all, Iléu (that of the Sielma Gallas), is particularly beautiful, being all well cultivated, and studded with villages adorned with trees.

11*th*.—Our course to-day was first descending to the torrent Hidálli, and then to the little Inderes river; after which we came to the great Inderes river, which runs between steep banks, with a stream about 10 feet broad. The whole of these streams seem to come from Mount Iléu, as a centre, and again to concentrate in a point of low country, which we had to avoid by going round, as our course of yesterday and to-day shows. From the Hidálli the district of Yára commences, extending as far as the Great Inderes, where that of Ada is entered, both belonging to the tribe of Báyo Galla. About an hour's ride from the first-mentioned river is the village of Ada, in a lovely rich level country. Thence the road descends to the dry torrent Yibugérbi, after which it becomes rough and jungly, and so continues till close to Abádo, the residence of the Galla chief Gúrichi, subject to Abba Moalle, to whose care I was committed by the Shum of Lélisa, with instructions to see me across the Jámma to the residence of Marie Sáburo, the independent chief of the Dorra Gallas.

12*th*.—After quitting Abádo the road led down the steep face of the mountains, through a thick jungle, to the river Jámma, which we reached after a descent, principally on foot, of about three hours. The river winds, about W.N.W., between mountains which on both sides dip into the stream, as is shown in Mr.

Salt's view of the Tacazze; but here and there a breach is left, at one of which places we crossed. The stream was here about 25 to 30 yards across, and the beach on each side about twice as much; the current rapid, and in the centre about three feet deep. The river Labbú joins the Jámma a very short distance above where we crossed the latter river. On the northern side of the Jámma, the mountains, though steep, are not so much so as on the southern, nor is the jungle so thick. The country we now entered belongs to the Déria Gallas; and, after an ascent of about two miles, we reached the first village, a tolerably large one, called Dáda. From thence the ground is more level, but only partially cultivated, being at first rather stony, and beset with thorny acacias, and then consisting almost entirely of fine meadows. After a ride of about two hours through the country, on ascending a slight eminence, we obtained a sight of the river Abaï, winding, like the Jámma, between steep mountains; and at this distance appearing of not more consequence than that stream. Shortly after which we reached Selalkúlla, a village situated on an insulated projection of the mountains lining the valley of the Abaï, the residence of Marie, the son of Sáburo, whence, to distinguish him from others of the same name, he is, according to the usual custom in this country, called Marie Sáburo. Selalkúlla is a collection of rude huts; that of the chief being little better than those of his subjects, who seemed to live almost on terms of equality with him, and to be kept in order only by the discipline of the stick, which he administers very freely. He says he is a Christian, and wears round his neck the blue string common to the Abyssinians; but I was assured by several persons that he and his whole tribe, with very few exceptions, are pagan Gallas.

Abba Moalle had done his best to secure my good reception in this place by sending a messenger on before me, and by giving me two of his servants to accompany me thus far; I had, however, anything but reason to be satisfied with the treatment which I experienced during a tedious detention here of ten days. The sole object of Marie seemed to be to get from me as much as he possibly could; and had I not at length made a dead stand, and insisted on returning to Abba Moalle, rather than be subjected to his impositions, I believe he would have gone on with his demands until he had stripped me of everything. Independently of a sword and a variety of other articles, I paid him ten dollars in money, an immense sum among these savage tribes, to whom the sight of silver is scarcely known. In itself this might not be considered too much for my safe conduct through a wild and dangerous country and across a large rapid river, but it was the manner in which he kept daily raising his demands which induced

me to make the strong opposition I did. At first it was only *three* dollars, then five, then seven, then ten; and even before I had consented to pay this last sum he had the modesty to ask for twenty! And after all not a single engagement made on his side was kept. He was to see me *in person* across the river, from whence ten *balagusha* (armed men) were to accompany me to Shébal, where the plain country of Godjam begins, and six were then to go with me as far as Dima, the residence of the Déjasmach Goshu; instead of all which he went with me half way down to the river, and then returned, leaving me at the mercy of his people, who allowed me to be robbed, and assisted in robbing me of nearly half my baggage. My escort, consisting of merely three or four unarmed men, instead of being a protection, required looking after; and I was very glad when, on reaching Shébad, they left me altogether.

23*rd.*—This afternoon I left Selalkúlla, descending from and passing under the steep side of the Amba; and leaving Kundi, the residence of Sáburo Marie's father, to the right, we passed through the villages of Sálka and Falassi to Kuyo, situated on the edge of a terrace of the valley of the Abai, the course of which river from the N. was now plainly visible. Here we stopped for the night, having come down thus far in order that we might have the whole day before us for crossing the river.

24*th.*—After taking leave of Marie, most glad to get out of his clutches, I started at sunrise, escorted by a relation of his and a number of men, partly those of Marie himself and partly of the Shum of Kuyo, who were to transport me and my baggage across the river. During our descent I was entertained with frightful accounts of hippopotami and crocodiles, which, in addition to the Jarsa Gallas, who were represented as a race of robbers and murderers, swarmed in the waters of the river and infested its banks; but I estimated these tales at their proper value, and therefore was not at all surprised at seeing the numerous herds of Marie and his father quietly grazing on the sides of the stream and drinking its waters. It was about 9 o'clock when we arrived at a bend of the river which here comes from the N.N.W., turning then round to the westward. The stream runs rapidly, with a very winding course, among mountains, and with a very irregular width, at times with a broad shingly or sandy beach, and at others close under the bluff of the mountains. We did not cross here, but ascended a little way along the bank of the river to a point where it turns to the E.N.E.; and here, after a good deal of talk, it was decided that the passage should be made. While my escort were debating and quarrelling among themselves, I ascertained the level of the river, which I made to be a little under 3000 (2936) feet above that of the sea, which gives a

fall of little more than a foot per mile during the remaining course of its waters to the Mediterranean. The determination of this height is interesting on another account, as, being in the immediate vicinity of the junction of the Jámma, which river concentrates in its bed the waters of all the rivers to the E. of Ifat, it shows the drainage level of the whole of the extensive district which they traverse. The breadth of the river, at the point where we crossed it, I made to be nearly, if not quite, 200 yards. Its current at some distance from the eastern side is considerably more rapid, so as in fact to render it somewhat difficult to reach the bank. This was evidenced by some of my cattle being unable to cross on the first attempt; and one mule was three times carried back by the eddy a considerable distance down the stream; and it was not till the fourth attempt, with a man at its head, that it was brought over in safety. The passage of myself and baggage was effected in the following rude manner: —I had been repeatedly given to understand that the river, though deep, might still be waded over by tall men, who could carry my effects over on their heads; and I did not learn till I got down to the river, that it was still too deep to allow of this process, and that all my things had to be unpacked and put into bags of entire sheep-skins, which, without previous warning, I was now called on to produce. I happened to have several with me, three of which were selected and made, or pretended to be made, water-tight, by tying up the places where they leaked. I wanted to construct a raft, and began cutting down trees for the purpose, having plenty of small rope with me; but this was absolutely resisted by the people, who said they *and their river* knew nothing of such things, so that I was at length obliged to desist, and to let them have their own way. My things were therefore all turned out on the beach, and crammed by the aid of their hands and feet into the skins, which were tied round the neck with bands of the bark of trees brought from the Kúyo. These bags were bound on my servants and myself in front of us round our loins, and a man, with a gourd lashed to the small of his back, supported us on each side; I was favoured with a couple of boys on each side, and a third man went before me. The things which we did not thus bring over were loaded on a small frame of wood of the most inartificial construction, which did not pretend to keep them out of the water, but merely to prevent them from sinking to the bottom; and this was conducted by two men in the same manner as our persons. I had only two servants with me, one of whom went on first to receive the things as they arrived, I remaining with the others till the greater part had crossed, when I myself also went, leaving him in charge of what remained. But no sooner was I off than Marie's people began to make off with my property, seizing some articles

openly, saying they were for their master, whilst still more were secretly abstracted by them. My servant could offer no effectual opposition, for he was but a boy, and was besides scared out of his wits by the water. On the Gojam side, too, many things which I knew to have crossed in safety were purloined by the people who accompanied me; and how could I prevent it, where everything was open loose upon the ground, and the people all crowded round without the possibility of my keeping them off? And this, bad as it was, was far from being the worst—*everything* I had, without exception, was thoroughly drenched—books, instruments, medicines, papers, clothes, all shared the same fate. It was utterly impracticable to dry them where I was; for it was getting late in the afternoon, and we had some distance to go through the jungle, which, as being an uninhabited border-country, may, without placing any stress on the people's exaggerated accounts, be reasonably regarded as not altogether safe. As it was, it was not till four o'clock P.M. that I was able to get off. Our course was now ascending, principally N., on the opposite side of the river; and after a slow ride of three hours reached the house of a man named Góbana, who had come down to act as my guide, or rather to assist in robbing me. His house was situated in a straggling village, which they told me was called Shébal; but this name, I afterwards found, is applicable to the whole district, from the Abaï as far as the plain country of Gojam.

25th.—This morning my first task was to spread out my things in the sun to dry, which occupied me until the afternoon. It is useless to enter into the particulars of all the loss and damage I found I had sustained. In short, everything that could be spoilt was spoilt; and the number of articles missing was quite distressing, the whole being, in this distant country, irremediable. At this place, too, various other things were abstracted by my host, who pretended to be most zealous in keeping other persons off, and thus rendered me less watchful of himself. Among other articles taken from me here was a box containing a tolerably large supply of medicines, the loss of which I did not discover until my arrival at Díma. The déjasmach was good enough to send down a messenger with my servant, and subsequently a person of rank, to obtain restitution of these medicines, as well as the rest of my property, and he succeeded in obtaining a few articles, as also the box; but, alas! its contents had been examined and pulled about, and mixed in such a way that not more than three or four of the commonest ingredients remained fit for use. It was 3 P.M. before I could proceed on my journey to the plains of Gojam, which I was told I should reach by going on late in the evening. However, scarcely had I left when my escort of Marie's people, who had not yet left me, wanted me to stop at the house of a re-

lation of their chief; and it was only by my persisting on going on alone that I succeeded in proceeding till I was met by the shum of the Christian portion of Shébal, who had come down to meet me, in whose company I stopped at a small Galla village for the night, arriving there about 7 o'clock. The country on both sides of the Abaï presents much the same features as that in the vicinity of the Jámma. A succession of bluffs clothed with jungle descend, not in one sweep, but in terraces, to the level of the river, which runs winding between them. Above, the jungle is occasionally intermixed with cultivation; but below it is uninterrupted, becoming thicker the nearer it approaches the river. Beasts of prey are said to infest the country in numbers, but I saw nothing like the trace of one. The inhabitants of the eastern bank are Mietta Gallas, nominally subject to the ruler of Gojam, whose hold on them would, however, appear to be not very strong.

26*th.*—To induce me to stop last night I was given to understand that it was the shum's own house; but this morning I learnt that he lived a little way farther on, and that we were to go on there this morning, and remain there for the day. After leaving, we soon passed a small torrent called Aratie, which divides the Christian from the Galla population of Shébal; and after not more than an hour and a half's ride, reached our resting-place in another small village, of which I could obtain no other name than Shébal. When I inquired for a distinguishing rank between all the various places, they gave me the name of the head man. My present host's name is Batára.

27*th.*—At this place I found I was not yet clear of the thieves by whom I had been surrounded during the last few days. Three luggage-horses were stolen during the night, but the thief was followed, and the horses brought back; and as my things were all secured in bags (which, however, were attempted to be opened), they contented themselves with stealing my servant's girdles, knives, &c. It was with heartfelt satisfaction that I at length got clear of this villainous neighbourhood. The road, on leaving, kept slightly ascending in a north-westerly direction, the country becoming free from jungle, but showing few signs of cultivation. In about two hours we reached the church of St. Abbo, and the plain country of Gojam. The district of Shébal still continued, however, for another hour, when, on passing the head of a ravine, we entered the district of Agám, and subsequently those of Kácham and Anselál, passing through the villages of these names respectively. Thus far the country was an extensive grassy plain, occasionally slightly undulating, without trees, and with scarcely any cultivation or inhabitants. I was told that it was formerly a mere waste, and that it is only very recently that it has been inhabited, even scantily as it is. After passing Anselál, the country

becomes more irregular and woody, and continues so till near the large town of Bíchana. This town, which is pleasantly situated on a low eminence, appears to have been formerly of much more consequence, it being surrounded with strong stone walls, and most of the houses having walls of the same material; but all is now fallen into great decay, the walls being broken down, and the present houses being merely hovels of wattles covered with mud. In its time of greatness, it was the capital of Ras Háilu (Déjasmach Goshu's maternal grandfather), whose residence, a little way out of the town, was pointed out to me.

29th.—After remaining Sunday at the house of the governor of Bíchana, Aito Lalakal, I left this morning for Díma, the present residence of the Déjasmach Goshu. On this part of the road I had no escort, and not even a guide, the governor considering it unnecessary to furnish me with one; and I was obliged to hire a man to show me the way, and to help to take care of my baggage. This country I find already very different from Shwá. There one cannot move without the Negus's knowledge and permission; having obtained which latter, one has also every assistance rendered. Here every one appears at liberty to go where he pleases, and no permission being required of the authorities, no facilities are afforded by them. The country for the first hour is irregular and barren, after which it gets more level, but still has but little cultivation. On the road I was met by crowds of people flocking from Díma and the neighbourhood to the market of Bichana, which is held weekly on this day. At the end of about another hour, a large torrent named Wati, now nearly dry, is reached, and after a similar lapse of time the river Gád is crossed just above the point where it falls several hundred feet perpendicularly and without the least break into a ravine which continues to the Abaï. At the present season the small thread of water which passes over the precipice is lost in spray during its descent; but during the rains the fall must present a most magnificent spectacle. The road, which has hitherto been to the W. of N., now turns eastward, and in about an hour and a half the town of Díma is reached, commonly known by the name of Díma Gurgís, from the large monastery and church, dedicated to St. George, which it contains.

Díma is a large town, apparently of recent construction, divided into quarters, which are surrounded by stone walls; many of the houses are also constructed of the same material. The church of St. George is the largest edifice of the kind which I have seen in Abyssinia, and internally the walls are adorned with paintings, much in the style of those of the middle ages in Europe. It formerly belonged to Guálu, the cousin of Déjasmach Góshu, who, until a short time before his death, was Déjasmach of Gojam.

He was, however, deprived of his dignity by Kasali, who nominated Biru, the son of Déjasmach Goshu, as his successor. Most of his possessions appear, however, to have been permitted to remain in his hands, and, on his death, he left Díma to one of his sons, Adál, a boy of about eleven years of age, who now resides here.

But shortly before my arrival in this country great political changes had taken place. Biru, who had obtained this government through the influence of his father Goshu, the Déjasmach of Dámot, under whom he held it, had risen against his father, deprived him of all his possessions, and forced him to take refuge at Díma, where I found him on my arrival, holding a small court and retaining but a small portion of his former dignity. But he had applied to Ras Ali for assistance against his son, and that ruler had set out on his march to Dámot, by the way of Dembea, with a large army for the purpose of subjecting Biru, and restoring Goshu to his former power. According to intelligence recently received, Ras Ali has already approached the frontiers of Dámot, and Biru has fled before him. The former is expected shortly to arrive here, when Déjasmach Góshu will accompany him to resume possession of his former territories.

These occurrences have, of course, put a temporary stop to any farther progress, but I have been promised by the Déjasmach that I shall accompany him to his capital Gúdera, which is close to the sources of the Abaï, and that, when arrived there, I shall have every facility afforded me of visiting the markets of Burie and Báso, which are the grand marts for the slaves, &c. brought from the interior, and where I hope to obtain much valuable information.

I am not able to send you a map of my route by the present opportunity, but I shall get it ready to send when the messenger who takes this letter to Shwá returns, which I expect will be in the course of a month or so. I send you, however, inclosed a note of the observations I have made during the journey for determining the latitude, as also the elevations of the several stations, and likewise a list of the forty-eight geological specimens collected on the road, which accompany the present letter, and which will be sufficient to furnish a general idea of the country I have traversed.

Before closing this letter I may mention that Mr. Blondin, the Belgian consul in Egypt, has lately been on a visit to this country accompanied by a numerous suite. He left Díma on his return by the way of Senaar only three weeks before my arrival.

MISCELLANEOUS.

I.—*Account of the Mound at Grave Creek Flats in Virginia.* By Mr. Schoolcraft. Transmitted by Sir J. E. Alexander, in 1842.

The Tumulus or Mound at Grave Creek Flats is situated on the east bank of the Ohio, twelve miles below the town of Wheeling, in Marshall county, Virginia. Its figure is a truncated cone, measuring 295 feet at the base, 60 at the top, and 70 feet in perpendicular height. Its height appears to have been originally greater, and its form more regular; but the influence of the weather has furrowed the outward surface and spread *débris* round its base; and the collapsing of the interior cavities has caused it to settle to one side, and the plane at its summit to form an acute angle with the horizon, instead of being parallel to it.

When this part of the western country was first visited, the mound was covered with the common growth of the forest. A white oak stood on the summit, which was four feet in diameter, and which, when it fell, was inferred, from the number of its cortical layers, to have been 700 or 800 years old.

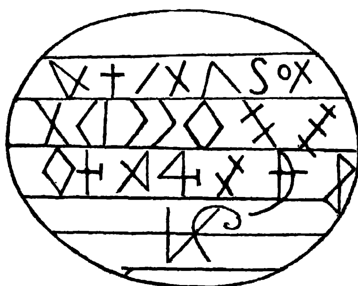
No excavation had been made in the mound when Mr. Schoolcraft, then an Indian agent, visited it for the first time, in the spring of 1818. It bore at that time a spare growth of forest-trees of moderate size. The banks of the Ohio in the vicinity are alluvial, resting on the carboniferous formation of Pitsburg: fragments of compact sandstone and grauwacke appear in the bed of Grave Creek; but no stone of any size, either rounded or angular, appeared on the sides of the mound.

Early in 1839 the proprietor of the land determined to excavate the mound. At the base a gallery was run horizontally to the centre of the structure; a shaft was sunk perpendicularly upon this from the summit; and the mound was penetrated at its mid height by another gallery.

The first seven feet above the level of the base were evidently a natural hillock, of which the builders had availed themselves. Immediately above this was a cavity, in which were found fragments of two human skeletons, in a state of great decay, the teeth only being perfect: the cavity was circular, and had been formed by placing posts close to each other, and covering them with flat stones. The stones generally resembled the loose shods (?) in the Grave Creek valley: a few were of a rock which occurs *in situ* on the west bank of the Ohio. Nothing of the wood re-

mained but a black mould in the bottom of the cavity, and the impression of the outlines of the logs and of the surface of their bark distinctly left on the compact earth. When cleared out, the cavity measured 9 feet in height. From the height of the cavity and the position of the bones, it was conjectured that the bodies or skeletons had been placed in a standing position. Nothing was found in this cavity but the bones.

About 16 or 17 feet above the top of this cavity was a second, constructed in the same manner, and containing the remains of a single human skeleton. The cranium broke on raising it, and all the bones were further advanced in decomposition than those of the skeletons in the lower cavity. Here too the teeth were in perfect preservation; and a full set (32) were found. Along with these bones were discovered 1700 ivory beads; 500 small sea-shells of the volute class; 66 pieces of mica, each of which contained four perforations, apparently for the purpose of uniting them; "five copper bracelets or arm-bands, but without being soldered at the points of junction." None of these relics evinced any artistical talent or acquirements beyond what are possessed by existing Indian tribes. Along with them, however, was found a small elliptical stone table, with twenty-four distinct characters arranged in parallel lines engraven on it. An exact transcript of this stone, and the characters, the size of the original, is given in the accompanying drawing:—



The 22nd and 23rd characters, if we read from left to right, the 17th and 18th, if we read from right to left, says Mr. Schoolcraft, "are identical with the ideographic signs of the Algic hieroglyphics of America, denoting *death from an arrow.*"

With the exception of the seven feet of natural hillock, and the stones which had formed the roofs of the cavities, the mound consisted exclusively of "made earth."

II.—BARON VON HAMMER PURGSTALL, AND THE RUINS OF AL HADHR.

[The following letters are published for the purpose of doing justice to the learned historian of the Ottoman empire, by recording his priority in calling the attention of the literary world to *Al Hadhr*. Mr. Bland's letter was addressed to the secretary of the society, who immediately communicated it to Mr. Ainsworth, and received the subjoined reply.]

SIR,—I am requested by Baron Hammer Purgstall, of Vienna, to communicate to you his observations, which are best explained by the following extract from his letter:—

"I have just received the 1st part of the 11th volume of the Journal of the Geographical Society, in which is a most interesting memoir of Mr. Ainsworth on an excursion to *Al Hadhr*. Having collected all the passages relating to *Al Hadhr*, he does not mention that one in the Jehān Numā, to which I called the attention of geographers in the extracts I gave on the Geography of Asiatic Turkey, in the 13th volume of the 'Jahrbücher der Literatur,' p. 235.

"I would beg of you, through some member of that Society, to call Mr. Ainsworth's attention to these extracts, running through the 13th and 14th volumes, in which (p. 87) *Hatra* is again pointed out as one of the objects most worthy of the attention of travellers. I am glad to have seen fulfilled my hopes expressed two years ago.

"P.S. I have just now referred to the مراص, in which is the article *Hadhr*, vocalized so حضر.

"There is an account of its walls, bulwarks, palaces, and their ruins, bearing witness to its ancient splendour," &c. &c.

I have, &c.

N. BLAND.

Randall's Park, 29*th March*, 1843.

MY DEAR SIR,—I am much obliged by your attention in forwarding to me the copy of Baron Hammer Purgstall's letter, as it gives me the opportunity of acknowledging that the learned Baron's notices upon the subject of Al Hadhr were unknown to me, and I shall make a point of consulting the 'Jahrbücher der Literatur' at an early opportunity.

I am glad that the etymology in the Jehān Numā, which I believe was referred to by the Foreign Secretary of the Society, corresponds with that adopted in my communication; but from the etymology given by the Baron some would read Hhadhr.

As it would be impossible, unless a second edition of the memoir in question were to be published, to do justice to the claims of the learned Baron Hammer Purgstall's having called the attention of geographers to the very remarkable ruins of Al Hadhr twenty-two years ago—I beg to submit to your consideration, whether this would not be best effected by noticing this fact in the account of the proceedings of the Society as usually given in the 'Literary Gazette' and the 'Athenæum.'

I have, &c.

WILLIAM AINSWORTH.

Hammersmith, 12th April.

III.—*Notes of a Cruise in the Eastern Archipelago* in 1841. By Captain OWEN STANLY, R.N.

H. M. S. Britomart, Singapor, Nov. 1, 1841.

AFTER leaving Sydney we had a safe but stormy passage through Torres Straits, and found all well at Port Essington. Our services not being at all wanted there, the arrival of the captain and crew of the Montreal, wrecked on Alert reef, gave me a capital excuse for extending our cruize as far as Banda and Amboyna.

We first visited the Anson Islands again, where some additions to the plan were made. Having Mr. Earl on board, I left the information-part of the cruize to be obtained by him, while Mr. Hill and myself devoted our time to chart-making and drawing. At Arru we saw little new, but at the Ki Islands we found and surveyed a fine harbour, where all sorts of supplies may be procured, and boats in abundance: we purchased four small ones for the settlement at a low price. Timber of good quality abounds, and can be procured close to the beach. The natives are well-behaved and very industrious. The southern Ki Island appears to be much cut up by deep channels, which would be well worth exploring, as the published charts give no idea of them at all. If Port Essington ever becomes a place of importance, the Ki Islands will be of great advantage, as a passage can be made both ways in both monsoons.

From Ki we proceeded to Banda; off the harbour we made a place, but were not able to get rid of our passengers. Banda is too well known to require any description.

From Banda we reached Amboyna in a day, and remained ten days to get a fresh rate for the chronometer. It rained almost incessantly the whole time we remained; but the few fine days enabled me to see a good deal of the country, which is very fine. During our stay we were all most kindly received. I remained

a week at the governor's, Colonel De Steer's, who has made a most valuable collection of the productions of the Moluccas in every branch of natural history: he is about to return to Europe, where I hope he will publish some account, for which he has ample materials.

On leaving Amboyna we first made Wetter, and then coasted along the north side of the Serwatty groupe, anchoring at Kissa, where they had been suffering much from the want of rain; and also at Letti, where they were suffering, but not in so great a degree. At Letti we found two Dutch missionaries and their families. The anchorage is good in the S.W. monsoon, but no quantity of supplies could be obtained. The reefs of the Luan groupe are much exaggerated and badly laid down.

Baber seems also to be much out of its place; but I have not time to spare to go round the island. After leaving Baber we made the island of Cera, on the west coast of Timor Laut, and then stood across to Australia. A good harbour is said to exist in the south part of Timor Laut, which is separated from the north part by a deep channel. Indeed I feel sure that when the island is properly examined, it will be found to consist of several islands separated by narrow deep channels. The inhabitants are not to be trusted, and are very numerous, well armed and warlike. I was very sorry that our provisions would not admit us to search for this harbour, as, from its proximity to Port Essington (only a day's run) we might derive great advantage from establishing a communication with the natives. Shortly after our return to Port Essington the Beagle arrived, having set the Carpentaria question at rest. She remained about ten days to get fresh rates, and then went to Coepang, to fill up her water before going upon the new coast, and to leave the tracings for me to forward. We sailed a fortnight after her, having been detained by putting the boats, &c. belonging to the colony to rights, and doing all in our power to put them in as efficient a state as the limited means of a ten-gun brig could do.

Up to the present time the settlement has been very healthy, the only cases of fever were cured by a trip with us to the islands. The gardens produce now nearly enough for the supply of the garrison; but the climate is too hot for European labour: the men all look worn. The trees do not seem to me to have at all recovered from the effects of the hurricane, which appears to have been very local, as the officer I sent round into Van Diemen's Gulf, in search of a wreck the natives said was there, saw no signs in the East Alligator river of any devastation whatever. He came across a new tribe of natives who, even at that short distance, could not at all understand our natives: they had never seen rice, and were only persuaded to taste it when they saw one of our

natives, who happened to be in the boat, eat it, when they immediately set to and did justice to the feast. Of the supposed wreck no traces were seen, nor could there have been one from the careful way in which Mr. Vallack pursued his search for it.

With the natives at Port Essington we are on the best of terms: the building of two solitary-cells has quite put a stop to thieving, two days' confinement having more effect upon them than any corporal punishment, however severe; they seem to be afraid of some bad spirit coming to them when they are alone and in the dark. One of the officers of the garrison happened to send up a paper kite just before we came in; the natives immediately took this to be a spirit till they saw the string; they then wanted to know if the kite was not sent up to look out for us.

On our return, after an absence of nearly two years, the moment I landed, the natives all knew me again, called me by name, and seemed quite glad to see me. We have not as yet been able to get any regular work out of them, but they bring in fish, shell-fish, &c. which they sell for bread and rice, of which they have become very fond; so much so that I do not think they could now do without it. To Mr. Earl I must refer you for all minute details about these people, as he has been longer amongst them, and has therefore had an opportunity of making himself acquainted with their manners and customs, while, during my short stay, I have been a slave to the Transit, which has not been idle. Mr. Gilbert, Mr. Gould's assistant, is also another person who will give you a very good account of the natives, as he was constantly amongst them. He ought to be soon in England with the fruits of his labours.

Upon leaving Port Essington we touched at Coepang, two days after the Beagle sailed, and there picked up the tracings he left for me, which I think will reconcile you to the change which it fell partly to my lot to make. From Coepang we went to Ampannan, which is a place just now of considerable trade; its history is this. About seven years ago, a Mr. King, who had failed in Java, arrived at the island, and found civil war raging; he took the part of one of the rajahs, and in consequence enabled him to obtain the supreme authority; on which the rajah permitted Mr. King to trade on the island, on condition of receiving a certain duty. The island of Lombock, being in parts very level and well-supplied with fresh water at all seasons, is so well adapted for the cultivation of rice that Mr. King has laden twenty ships in a year. In addition to the rice, stock of all sorts is very cheap—a cow seven dollars; a fine strong pony, far superior to the Timor, fourteen dollars; ducks two dozen for a dollar, &c. One drawback to the place is the way in which the reef is laid down in the chart, which prevents many vessels from entering. The water does

shoal, and in three places are shoal patches with only 3 fathoms; but these can be seen from the mast-head. A surf upon the beach, which is very steep too, makes it inconvenient embarking a cargo like rice, that requires to be kept dry.

We arrived fortunately just in time to be present at a grand feast, given by Mr. King to the rajah and family, and about two thousand of the head men of the place. The feast commenced at 10 A M., and continued till sun-set; and though every man came armed with his creese there was not the least disturbance. Dancing girls and boys, with a very comic tragedy, occupied the time not employed in eating and drinking: the whole scene was very amusing. The wife of the captain of an English merchant ship attracted universal admiration and surprise; her dress, ornaments, &c. were viewed with great curiosity by all the chiefs, and even by the queen, who is mother to the present rajah, and appears to take a decided lead in politics. I could go on at more length, but I find myself crossing, which warns me to bring this long yarn to an end. When we do return home, should we ever have that good luck, I shall be able to give you the whole detail of our cruize, both with pen and pencil, which latter, I can assure you, has not been idle, for I have a sketch, of some sort, of everything we have seen that would bear drawing.

IV.—*Tussac Grass.* By Sir W. J. Hooker.

[A report on the Falkland Islands by Governor Moody has just been printed by order of the House of Commons. Appended to it is a botanical description of the extraordinary tussac grass of those islands. An extract from the governor's report was communicated to the Society in the course of the present season. The following letter from Sir W. J. Hooker, addressed to the chairman of the evening on which the report was read, is interesting, as it communicates the information that the name Tussac appears to have been applied indiscriminately to several other kinds of grasses, and conveys a picturesque idea of the appearance of the plant to which the name will in future be restricted by botanists. It is also pleasing to learn that the son of one who stands so high in natural science as Sir William Hooker is devoting himself to botany, with all the zeal of his father, and the self-diffidence characteristic of real talent.]

You will perhaps not deem it unworthy the attention of the Society, that I should offer a little information on the subject of this extraordinary production of the Falklands, which probably, through the exertions of Lieutenant Moody, may ere long form

an important pasture on some of the otherwise barren coasts of England, and especially on those of Scotland and Ireland.

The following is an extract from the first letter I received from my son, Dr. Joseph Hooker, dated "Berkeley Sound, Falkland Islands, May 3rd, 1842."

"This place is better for botany than I had at first expected, every day adding something new to my collections.

"The governor, Lieutenant Moody, is much interested about the *Tussac Grass* (a species of *Carex* ? or *Sedge* ?); and as he is preparing tc send home a very extensive report of these islands, he has requested me to draw up a description of the plant. This I did in great haste, when on the point of starting with the cattle party to explore the interior: and as all the specimens that were forwarded to me for examination were imperfect and not in flower, so I cannot help apprehending that my description (which was enclosed in the Governor's report to Lord Stanley) may prove far from correct. Should you be able to get a sight of it, I should feel greatly obliged by your looking it over and seeing if it is intelligible. By the next opportunity I hope to send a fuller account of this *grass*, which Governor Moody much wishes to lay before the *Linnæan Society*. It is assuredly a most remarkable plant."

Now, this "*sedge* or *carex*" being thus doubtfully considered by my son as *Tussac grass*, I felt assured there was some error in the matter. All voyagers had spoken of this grass as constituting the best possible fodder for cattle, in short, as being what rendered the Falklands of such immense consequence for rearing the vast herds which abound in those islands; and from the hesitation with which my son spoke of the correctness of his report, I felt assured that, having arrived at the Falklands in winter, when plants are not in flower, some other grass, the dried specimens of some tufted *sedge* or *carex* (a grass-like plant, but very unsuited to cattle), had, by mistake, been put into his hands. I therefore wrote to the Colonial Office, begging that Lord Stanley would do me the favour to send me a copy of my son's report, and that he would not allow any use to be made of the report itself till I should be enabled to confirm its accuracy, or till further information could be afforded. This report I found to contain an accurate description of a large and beautiful and very little known *carex*, the *carex trifida of Cavanilles*. My son's subsequent letter, dated "Falkland Islands, May 26th," satisfactorily explains the mistake :—

"Since writing to you last, which I did about three weeks ago by the 'Arrow,' I have accompanied the governor in a most pleasant excursion to Port William. His immediate object was to look at the proposed site of a new town nearer to the sea than Port Louis is, at the head of this long harbour. We went down in a brig, the 'Alarm,' from

Guernsey, which has been here for some time, and we lived on board her a week, making short excursions into the surrounding country. Like other parts of these islands, the ground we traversed is quite bare of trees, and the whole surface covered with peat-bogs or grass lands, affording excellent fodder to the herds of wild cattle and troops of horses. Near the coast a very fine *grass* grows in prodigious abundance, called *Tussac*, *and a perfectly different plant it is from that of which I drew up a description two or three weeks ago at the Governor's desire, but which is also very common here and called* TUSSAC *too.* The *true Tussac* constitutes quite an extraordinary feature in the landscape, covering immense tracts, particularly where the soil is sandy. Round its roots it forms immense balls, which stick up 5 to 6 feet above the ground, and are often as much in diameter; on the top of these the *Tussac* throws up its stems, and long leaves, which hang down all round, and are often 6 or 7 feet in length. These heaps grow within a few feet of each other, leaving spaces generally bare of vegetation between them; so that in walking among them you are hidden from view, and the whole tussac patch forms a perfect labyrinth.

" Upon the whole I have got many more plants in this island than I had expected, especially at this late season of the year. Winter has now set in, fairly in earnest, the whole ground being covered with snow; and frosts very common, though not strong enough to afford any skateing. Collecting botanical specimens here, *sea-weeds* especially, is no sinecure; the days are so short, and the nights so long, and the weather generally so stormy and wet, as to render the tent a very uncomfortable berth. At San Salvador's Bay we had to floor it with gravel for a bed, under which the water drained; and there we lay down in a blanket bag, which is a blanket sewed up on three sides; you crawl in, feet foremost of course, and pull the mouth of the bag over your head. My bed, when out of the ship, always consists of the plaid my mother gave me, and either a blanket-bag or a rug of opossum skins, wrapped in which I can sleep very comfortably in the open air.

" I do not know if ———, during her stay in Jersey, ever met with Lieut.-Colonel Moody of Guernsey, who is father of the present Governor of the Falkland Islands. This gentleman is a particular friend of mine, and has been most kind to me, his house being open to me at all hours, and his library quite at my service."

This account of *two kinds of tussac* (and probably there are half a dozen grasses so called, for I apprehend the name *tussac* or *tussuck*, as Johnson spells it, is merely given from its very tufted mode of growth) is confirmed by a very recent communication from Lieutenant Robinson, R. N., from whom, through the kindness of the Admiralty, I had the pleasure to receive two days ago a box marked " Seeds, &c. from the Falkland Islands." On opening the lid of the box, the first object which presented itself to me was a fine tuft of leaves, more than 6 feet long, of the real *tussac grass*, and so labelled by Lieutenant Robinson; the next thing was a paper containing flowering spikes of the same grass, showing it to be a kind of *Fescue Grass* (*Festuca*): and thirdly there was a paper with the noble spikes of a *Sedge* or

Carex, marked by Lieutenant Moody, "Another kind of *Tussac Grass,* common in the Falkland Islands:" this is the *Carex trifida,* above noticed.

The real *Tussac Grass* is the *Festuca flabellata* of D'Urville: and to its extraordinary productiveness, highly succulent and saccharine nature, I believe all voyagers who have visited the Falklands have borne witness. But on this head no accounts are so worthy to be depended upon as those of the present Governor.

I need not say that I have used my best endeavours to have this valuable grass introduced alive to this country. Lieutenant Robinson has sent old flowering spikes, under the idea, so naturally to be entertained, that they contained seeds: but they are all abortive. It is highly probable, that with a plant, increasing so much by the roots, and in such an unfavourable climate as the Falklands for ripening the seeds of plants, the *tussac grass* can only be transmitted, with any chance of success, by taking up the roots and enclosing them in one of Ward's admirable cases, some of which I have already sent to the Islands for that express purpose.

V.—Danakil Tribes.

[The following statistical review of the distribution of the Danakil Tribes is one of a number of supplementary papers forwarded by Captain Harris, along with the report of the Mission's route to Schwá. It is a contribution not devoid of interest to political geography.]

The tribe and authority of the Sultan of Tagura extend from Mursa Dooan to the Salt Lake. From the Salt Lake to Rumadali is the territory of Loheita Ibn Ibrahim, Agil of the Roheitas, who are also called Debenik. From Rumadali to Suggagidan is the territory of Ibrahim Ibn Hameido, Agil of the Eya Somauli (Wuhima). From Suggagidan to Warnulli is the territory of Wyess Ibn Hugaio, Agil of the Wuhima. From Wanimilli to Murow belongs to the tribe of Debenik, who have two chiefs, Bedr and Abu Keri Ibn Sumbul. From Murow to How, Sheih Omar Buttú of the tribe of Tughael. From How to Ferri there is a mixed population from all the tribes, but principally the Abdalli, under the authority of the Walama Mahomed, under the King of Shwá. These tribes in time of war, or when called out to repel the attacks of either the Eesa or Mudnitas, their neighbours to the S.E. and N.W., assemble together under the title of Debenik Wuhima. The road lies through these tribes from Tajurra to Abyssinia, bounded on the N.W. by the Mudnitas, on the S.E. by the Eesa Somauli as far as Killullu, and from thence by the sub-tribes of the Gulla.

ANALYSES, &c.

I.—*Asie Centrale. Recherches sur les Chaînes de Montagnes et la Climatologie comparée.* Par A. de Humboldt. (Trois Tomes, 8vo. pp. 570, 558, 614.) Paris. Gide, Libraire-Editeur. 1843. [By the Editor.]

For this work the illustrious author informs us, in his preface, we are indebted to the call for a new edition of the 'Fragmens Asiatiques.' On reviewing the materials which he had been accumulating for twelve years, with a view to that task, he deemed it preferable to compose a work entirely new. 'Asie Centrale,' however, is still, like its precursor, only a fragment: Baron von Humboldt says,—"not having lost all hope of publishing some day a comprehensive work, projected under the rash title of Kosmos, I have, in the present publication, confined myself to mere outlines of the physical structure of the Globe."

The results embodied in Asie Centrale are the fruits of many years' study. When the author returned to Europe from Mexico in 1804, after an absence of five years, he found no *data* to enable him to institute a comparison between his observations on the line of perpetual snow in the Cordilleras, and any measurement among the Himalayas, Hindu-Kush, Caucasus. or Ararat. Doubts having been expressed in England respecting the prodigious height assigned by travellers to the line of perpetual snow on the northern declivity of the Himalayas, Baron von Humboldt published, in 1816, a memoir, in which he sought to prove that no considerations of terrestrial refraction or the general laws of physics justified such scepticism. In 1820, when the first intimation of the hypsometric observations of Moorcroft and Webb reached Europe, he published a second memoir in support of the opinion that the line of perpetual snow was most probably at between 11,000 and 12,000 feet on the southern declivity of the Himalaya, and not far short of 16,000 feet on the northern. About the same time, or perhaps at an earlier period, his investigations respecting the geography of plants, and the degree of heat required by certain agricultural products, had rendered him sceptical as to the continuity of a great elevated plain in the regions visited by Marco Polo. These inquiries and doubts kindled and kept alive in his breast an eager desire to penetrate into the regions of central Asia, for the purpose of comparing its geological structure

with that of South America, with the orographic chart of which he was then busy. A hope of accomplishing this object was held out to Baron von Humboldt when, during the reign of the Emperor Alexander, Count Romanzow invited him to accompany the mission destined to penetrate into Tibet by the route of Kashgar and Yarkand. The war of 1812 broke up this projected expedition. Undiscouraged, our author devoted himself for several years to the study of Persic, in expectation of an opportunity of effecting his purpose by the way of Tehran or Herat. The writings of Klaproth directed him to the rich fund of geological information embedded in the literature of China. Much more valuable and trustworthy contributions from that source have since been put in his possession by M. Stanilas Julien, who has laboured in the field indicated by the energetic and enterprising, but not always very scrupulous Klaproth, with the critical acumen of a sober judgment, and the caution of a sincere seeker after truth. It was after having enriched his mind by means of these preparatory studies that Baron von Humboldt, at the request of the reigning emperor of Russia, undertook, in 1829, a journey to the mountain ranges of the Ural and the Altai, and to the Caspian sea. The work now before us is the ripe fruit of these observations and reflections prosecuted for the long space of little less than forty years.

Asie Centrale is, as we have already stated, a fragment. Its fragmentary character is in part owing to the nature of the materials upon which the author has been obliged to work, which are themselves fragmentary in the last degree. It is also necessarily a fragment on account of the stage of development which the views expounded, or rather indicated in it, have reached in his mind. It is something intermediate between his specific and detailed works on America, and the comprehensive "Kosmos" which he tells us he has in contemplation. "Such"—exclaims Baron von Humboldt, when noticing the frustration of his hopes to penetrate into Central Asia—"such is the destiny of man: as he approaches the close of life, he contrasts with a sense of sadness the little he has accomplished with all that he has attempted to extend the domain of science." No man alive has less title to indulge in this despondent strain. It is probable that a "Kosmos," condensing the magnificently simple and comprehensive views of nature, to which the varied and extended inquiries of this author are conducting him, into a brief system, will never be completed by himself. It is questionable whether such a work will be possible for a century to come. But whenever it is executed, it will be in the sense of Humboldt's work, who is a lawgiver in science —who has projected the authority of his intellect into unborn time, and stamped the forms in which the thoughts of future natu-

ralists will be cast. Endowed by nature with a universality rare in kind and unprecedented in degree, he has experimented in every department of science;—endowed with an exquisite sense of the beautiful, and a powerful imagination which might have made him a poet of no common order, he has combined into one whole the discordant results of special sciences;—in the true spirit of an inductive philosopher, he has advanced from his detailed inquiries, observations, and experiments in America, and from corresponding operations in Europe and Asia, to general views of the individual structure of the world, and its relative position in the universe;—and even though his life may close before he is able to give utterance to these views with all the completeness and condensation he may wish, still he cannot but feel assured that future thinkers will recognise him as their author. In Humboldt's age there have been more exact and accomplished mathematicians—more learned and precise naturalists—but he stands unrivalled for the largeness of his intellectual grasp, for the success with which he has brought all branches of knowledge to bear upon and elucidate each other, and for his power of stimulating others to labour by his contagious enthusiasm. If the results of his life's labours are to be left in the fragmentary state in which they at present exist, scattered through so many works, the colossal character of the fragments will attest that this has been owing to his being endowed with a sense of the greatness of nature, beyond what it is yet given to the faculties of humanity adequately to express.

'Asie Centrale' consists of two great divisions:—the first is devoted to considerations on the mountain-ranges of that region, and their great geological characteristics; the second to inquiries respecting Asiatic climatology and terrestrial magnetism. In the first of these divisions the author frequently refers to the analogies and to the contrasts which the Cordilleras of the New World and the Alpine region of Europe offer to Central Asia; and in the second he has annexed to the climatology of Asia general inquiries respecting the direction of isothermal lines, the causes of their inflections, and the elevation of the line of perpetual snow, in both hemispheres.

The first division of the work occupies entirely the first and second volumes. It is subdivided into two parts: the first (extending to nearly two hundred and thirty pages of the first volume) contains general views of Asiatic geology; the second, a special orography of Asia.

At the outset the author is careful to define with precision to what region of Asia the term "Central" is with strict propriety applicable. The expressions "central regions," "unknown regions," "interior regions of a continent," are often vaguely and improperly used as synonymous. Travellers in India who have

crossed the Himalaya from south to north, when they reach the Sacred Lakes on the table-land, are still only on the road to Central Asia, and as remote from it as the inhabitants of Siberia under the parallel of Tobolsk, Krasnoiarsk, or the northern extremity of the Baikal. When the configuration of Asia is considered, and the extent of its surface calculated, abstracting the peninsular elongations, it will be found that its centre falls between the parallels of 24° and 65° N., and between the meridians of the Caspian and the South Sea, consequently about 44½° N. lat., 85° E. long. (from Paris). This central point is situated between the mountain chains of Tien-shan and the Altai, not far from Lake Ayar. The distance from Lake Ayar to the shores of the Icy Sea is about 20° 12′ of latitude; to the shores of the Gulf of Bengal, about 22°. Taking the region of Asia which extends to 5° S. and to 5° N. of the mean parallel of 44½° N. as the central region of Asia, a correct enough view, it will be found to comprehend the most southern part of the Altai-Kolyvan, between the parallels of Bukhtarminsk and Ust-Kamenogorsk, and a great part of the Steppe of the Kirghiz. The excursion of Baron Humboldt in 1829 brought him into this region. The bold and successful excursions of M. Vigne only conducted him to about four degrees of latitude south of it. In making this remark, however, our author, with the strong sense of justice to the merits of all scientific collaborateurs, which is one of the finest features in his character, immediately adds: "These numerical considerations, deduced from continental forms, noways derogate from the desert of those who have devoted themselves to perilous enterprises in the Alpine regions of Asia. The importance of an expedition does not depend upon its closer or more remote approach to the centre of Asia, or on the distance of its terminus length from the coast, but on the number and precision of its observations and the light they diffuse on the phenomena of physical geography."

The author's next care is to dissipate the erroneous and exaggerated notions which have prevailed respecting the extent and elevation of a great central Asiatic table-land:—" A plateau of considerable height extends in all probability without interruption in the direction S.S.W. to N.N.E. from the Lesser Bokhara to the country of the Eastern Khalkas and the chain of Khankai. Assuming the correctness of the positions of Pekin and Khotan as determined astronomically by Father Hallerstein and M. Fuss, this continuous table-land lies between the meridians of 79° and 116° E. of Paris, and its northern and southern boundaries are the 36th and 48th degrees of N. latitude. This gives to the plateau of the Sha-mo, or Gobi, an extent of 42,000 to 43,000 square leagues, of 20 to the equatorial degree. Adding to this table-land the high region of Tibet, which is separated from it by the moun-

tain-range of the Kuen-lun, we have, between the northern declivity of the Himalaya and Chinese Mongolia, an elevation of the earth's surface occupying a space of 60,000 to 62,000 square leagues. This is about four times the extent of France, but scarcely larger than the long stripe occupied by the Cordillera of the Andes in South America. Here I compare two kinds of elevations materially differing in form and age. In Asia the axis of the great elevation is directed from S.W. to N.E., and its existence is anterior to that of the great mountain-ranges parallel to the equator about to be described." This elevation, he continues, is far from filling up the immense space of the interior of Asia, though it is beyond doubt the most extensive plateau with which we are acquainted. Its absolute height above the level of the sea is unknown; it has been ascertained only at the northern and southern extremities. Inferences drawn from agriculture and spontaneous vegetation, from a small number of measurements by the barometer and the boiling-point of water, lead to the conclusion that its height is very unequal, and much less than has been supposed. The careful measurements of Fuss and Von Bunge have shown that the part of the Gobi traversed by the caravans from Pekin to Kiakhta, instead of being 8000 feet above the level of the sea, does not exceed 4000. The central part of the Gobi scarcely attains the height of 2400 feet. The *continuous* elevation of the great table-land between the Himalaya and the Kuen-lun does not appear much to exceed 10,000 feet. Shipke on the Sutlej does not reach that elevation, and Kashmir attains only to 5350 feet.

After these preliminaries, and after pointing out the pervading influence of volcanic agency in determining the form of the crust of the globe, and the influence of geological constitution of Asia upon the geographical distribution of plants and animals, meteorological phenomena, the currents of the atmosphere, &c., Baron von Humboldt proceeds to take a general view of the mountain systems of Asia. The first feature that strikes him is the greatness and continuity of the mass of this continent as contrasted with its peninsular extension, Europe, which is channelled and intersected by parallel and recurring seas. The plateau noticed above occupies a considerable portion of this continental mass; but alongside of it is found the most extensive continuous depression of the dry land of the globe—that occupied in part by the Caspian and Aral seas. The plains of Northern Siberia, though somewhat more elevated, are still remarkable for their continuity of depression.

The mountain-ranges of this immense continent present a much greater diversity and complexity of structure than those of America. In the latter continent the single mountain-system of the Andes unites in a narrow zone, 3000 leagues in length, all the

summits which rise more than 8400 feet above the level of the sea. The five mountain-groups east of the Andes (those of Brazil, Parima, Venezuela, the Antilles, and the Alleghanies) have a mean height of 3000 to 4000 feet, and their culminating points do not exceed 3700 feet. The plains of America are of great extent in a *meridional* direction; the Pampas of Buenos Ayres and the Savannas of Louisiana and Canada are covered at one extremity with ice and snow for the greater part of the year, while palms and bamboos flourish at the opposite end. It is owing to this peculiarity that tropical forms of vegetation, and birds natives of tropical regions, are found in America, in regions which can scarcely be called temperate. The principal chains of Asia, on the contrary, are parallel to the equator, and effectually prevent the gradual fading of the equatorial into the polar type of vegetable and animal life. They are crossed moreover by considerable chains parallel to the meridian, which further interrupt the continuity of the plains, isolating the depressed portions of the Asiatic surface, and stamping each with a marked local idiosyncracy. The chains parallel to the equator are—the Altai, the Tien-shan, the Kuen-lun, the Taurus, and the Himalaya. The systems parallel to the meridian are—the Ural, the auriferous range of Kusnetz, the Bolor-tag, and the Suliman range. Of these, the Altai, Kusnetz, Ural, Tien-shan, Bolor, Himalaya, and Kuen-lun mountains—and along with them the depression which separates the Altai from the Tien-shan, and the region of steppes around the bases of the Ural, Altai, and Tien-shan—are, as belonging to Central Asia, made each the subject of a special memoir in the second part of the first division.

The Altai extends between 50° and 52½° N. lat., from W. to E., from the confluence of the Uba and Irtysh to Mount Gurbi, and the south of lake Baikal. The mountain-system of the Altai contains the sources of the Irtysh and of the Jenisei. The names Sayan, Tangnu, and Malakha are applied to easterly portions of it; beyond the Baikal it abuts upon the mountain-ranges of the Western Khin-gan and Jablonoi Khrebet, which extends from N.E. to S.W. The Altai range occupies a space of 4100 leagues (20 to a degree), or an area equal to that of England. Except at the eastern extremity it is everywhere surrounded by low lands. The Altai cannot therefore, with any propriety, be classed among the mountains which border elevated plains like a line of circumvallation (*Randgebirge*). The elevation of the Gobi only begins at 93° E. of Paris: and the plains which lie around the lakes Dsaisang, Balkash, and Alaktugul, in all probability do not attain the elevation of those on which are situated the cities of Munich, Madrid, and Toledo. The subordinate chains which form the Altai system present a remarkable uni-

formity in their directions. The masses which rise above the line of perpetual snow are all between the parallels of 49½° and 51°. The order in which the ranges succeed each other from S. to N. in this alpine region of the Altai is as follows:—1. The Narym mountains, between the rivers Narym and the Bukhtarma. 2. The Sailughem mountains, between the rivers Bukhtarma, Tshuya, and Koksun. 3. The Koksun or Ubinsk range, between the Koksun and the Uba. 4. The alps of Terektinsk, between the Tsharish and the sources of the Koksun and Uba. 5. The range between the Tshuya, the Tsharish, and the Anni. The culminating summits of the Altai are in the second of these ranges. M. Gebler, who made three journeys to the Upper Altai between 1833 and 1835, describes Mount Bialukha (Mount Blanc) the highest summit, as inaccessible, and running up into two pinnacles covered with snow. He estimated its height approximatively at 10,300 feet—rather higher than Etna, and rather lower than the highest summit of the Pyrenees.

The Kusnetzk system of mountains has a direction from S.S.E. to N.N.W.: it comes in contact with the Altai about 85° E. of Paris, on its northern declivity. The Kusnetzk mountains have a strong analogy, both in the mineralogical constitution and the direction of the chain, with the Ural. They extend over a line equal in length to that of the Alps or of the Pyrenees; in breadth they appear to occupy nearly a degree of longitude between the parallels 52° and 56°: their elevation is not mentioned. They abound in deposits of gold, which, as in the Ural, is found much more abundantly on the western than on the eastern declivity. Advancing eastward along the northern declivity of the Altai, a third rich auriferous region is found near the confluence of the Jenisei and the Abakan. Baron von Humboldt expresses a wish that some light could be thrown upon the geological relations of this district to the mountainous country of Kusnetzk. The auriferous soil (and the fact is worthy of attention) extends over a large portion of the north of Asia. Gold has been found from the Ural to the eastern declivity of the Jablonoi Khrebet, and the mountain-region between the Lena and the two Angoras, a distance of 56° of longitude. Gold has also been found at Udskoi, not far from the sea of Okhotsk. It would appear, therefore, that an auriferous belt traverses the old continent between the parallels 50° and 60°, for a distance that exceeds the maximum breadth of Africa. Since 1823 the gold of the Ural mountains has begun to replace that of Brazil; and as the gold-washings of the Ural have become less productive since 1831 and 1832, the gold of eastern Siberia has supplied the deficit. This golden region carries back the imagination irresistibly to the traditions of

the griffins and Arimaspi of Aristæus and Herodotus, in the regions N.E. of the Euxine.

The Ural, an assemblage of nearly parallel mountain-chains, is the most extensive elevation in the direction of S. to N. that is found in Asia. It is an almost isolated system, which extends parallel to the meridian for 700 leagues (20 to the degree), if we take the isthmus between Lake Aral and the Caspian as its southern prolongation, and the mountains of Nova Zembla as its northern terminus. This length is equal to the part of the Andes intercepted between the Straits of Magellan and the bay of Arica, or, to the breadth of Europe, from the southern headland of Peloponnesus to Cape North. Papers, containing valuable information respecting the southern and eastern Ural, communicated to the Society by Mr. Murchison, are preparing for the press, and will appear in the next part of the 'Journal;' under these circumstances we decline following our author at present into his details respecting this range. It may, however, be observed, as indicative of the structure of north-eastern Asia, that the Altai chain, in the direction from east to west, bounds, over a vast extent, the low northern plains of Asia; and that the Ural and Kusnetsk chains, parallel to the meridian, are formations of a different era. They resemble in many of their characteristic features the Bolor and Suleiman mountains, and the Ghauts of southern India. The Altai, Kusnetsk, and Ural ranges also resemble each other in the abundance of their metallic wealth.

The Tien-shan is in its mean direction parallel to the equator. It serpentines between the 41st and 43rd degrees of latitude. It extends from Ming-bulak (or the thousand sources) of the western Buruts to the Chinese city of Kuku-khote (about 200 miles west of the great ocean); that is, from longitude 69½° to 111½° E. of Paris, about eight times the length of the chain of the Pyrenees. Westward of the cross-range of the Bolor, the Tien-shan extends as far as the meridian of Samarkand—the mountains of Asferah, celebrated in the memoirs of Baber. The denomination Tien-shan is strictly applicable only to the portion of the range intercepted between the meridian of the Bolor and the great swelling of the Gobi east of Hami and Barkul. Between lake Chagan and the western extremity of the In-shan (which, although two degrees farther south, is the continuation of the Tien-shan in China proper) the elevation of this range is less obvious, owing to the height of the table-land through which it rises. Baron von Humboldt remarks that the structure of the Caucasus is calculated to suggest the idea of its being a continuation of the great chain of Tien-shan to the westward of the depression around the Aral and Caspian. At the same time he throws out the sug-

gestion that the Taurus may in like manner be considered a continuation of the Hindu-kush. Bold though these speculations may appear, they will scarcely be considered too bold by those who advert to the length of the Andes in the American, and to the great scale of the whole frame-work of the Asiatic continent. The most remarkable heights of this system, in their order from the meridian of the Bolor eastward, are:—The glacier Jeparlé, between Ili and Kutshé; the extinct or dormant volcano (in activity as late as the seventh century) of Pé-shan, nearly on the same meridian as Gulja, on the banks of the Ili, and apparently in latitude 42° 25′ or 42° 35′; the huge mass of the Bogdo-Oola, apparently the culminating point of the range, which towers above the snow-line north of Karashar; the solfatara of Urumtsi, near the town of the same name; and the volcanic mountain between Turfan and Pijan, 540 miles east of the Pé-shan. The country around Bokhara, beneath the western termination of this range, was estimated by Sir Alexander Burnes as about 1100 feet above the level of the sea. From analogies of climate and vegetation Baron von Humboldt infers that the plains of Hami and Turfan, south of the Tien-shan, and west of the Gobi, are not higher than 1760 feet.

The depression, open at its western extremity, which lies between the mountain-ranges of the Altai and the Tien-shan, is intersected by several minor chains, of which the Tarbagatai appears to attain the limits of perpetual snow. A range of lakes, in latitude 45° or 45½°, stretches parallel to the base of the Tien-shan. Their names are, the Balkash, or Denghiz, the Ala-gol, the Alaktu-gol, the Borotola, or Bulkhatsi, and the Ayar-nor. M. Fedorew found, by an astronomical observation, the mouth of the river Lepsa, in the Balkash, to be in 46° 20′ 30″; its bearing is S.S.W. from the town of Ajaguz, which the same astronomer determined to be in 47° 30′ 30″. The lakes Ala-gol and Alaktugol are three degrees to the eastward of the Balkash. The waters of those three lakes are salt. The shores of the lakes Balkash and Issi-gol are about 200 miles distant from the volcanic mountain of Pé-shan, and about 550 from that of Turfan. The bearing of this fact upon the hypothesis that volcanic action is excited by the filtration of the waters of the ocean through subterranean caverns is apparent in the case of mountains known to have been active volcanoes since the Christian era, and of which the Pé-shan is rather more than 1500 miles distant from the icy sea, and about as far from the mouths of the Indus and Ganges.

On the great depression of the Caspian, and the steppes at the base of the Altai, Thien-shan, and Ural, Baron von Humboldt treats at considerable length. He enters with minuteness and detail both into the questions which have been raised respecting

the positive geography of this region, and respecting its comparative geography. Pages 121 to 364 contain an invaluable digest of the views entertained respecting the geography of the Caspian and Oxus by classical, and Arabian, and European geographers, and of the latest operations of Russian savans and military men. The results of this comprehensive review only can be indicated here. Baron von Humboldt denies the existence of any mountain-chain connecting the Altai and the Ural. He points out, however, that all the isolated groups of hills sprinkled over the steppe which intervenes between these mountain-ranges rise along the line of the watershed between the affluents of the Irtish to the north and of the Sara-su to the south. Even this non-continuous range however, apparently an attempt of nature to continue the Altai range westward, terminates entirely before it reaches the meridian of the Ural, about the meridian 63¼° E. of Paris. A depression, of 5° of longitude in length, intervenes between this terminus and the Ural; and the characteristic feature of this depression is an immense number of chains of small lakes, communicating with each other, arranged in a circular form, or like a necklace. In these lakes Baron von Humboldt recognises the traces of an ancient channel of communication between the waters of the Aral and the Icy Sea. The conclusions at which he arrives respecting the ancient junction of the Aral, Oxus, and Caspian are in substance as follows:—

1st. That, at a time before the historical era, but nearly approaching to the terrestrial revolutions which immediately preceded it, the great depression of Central Asia—the concavity of Turan—may have been one large interior sea, connected, on the one hand, with the Euxine, on the other, by channels more or less broad, with the Icy Sea, and the Balkash and its adjoining lakes.

2nd. That, probably in the time of Herodotus, and even so late as the Macedonian invasion, the Aral was merely a bay or gulf of the Caspian, connected with it by a lateral prolongation, into which the Oxus flowed.

3rd. That, by the preponderance of evaporation over the supply of water by the rivers, or by diluvial deposits, or by Plutonic convulsions, the Aral and Caspian were separated, and a bifurcation of the Oxus developed, one portion of its waters continuing its course to the Caspian, the other terminating in the Aral.

4th. That the continued preponderance of evaporation has caused the channel communicating with the Caspian to dry up.

These conclusions are worked out with the wonted caution and extensive and minute inquiry of Baron von Humboldt. Still we must, notwithstanding our deference for his opinion, remain scep-

tical as to any communication between the Oxus and the Caspian during the historical period, until we are in possession of more exhaustive, intelligible, and trustworthy information respecting the structure of the country bounded on the east by the Aral and Oxus, on the west by the Caspian, on the north by the line of levels run by Russian engineers from the Caspian to the Aral, and on the south by Burnes' route from Bokhara to Meshed. The definitive result of the trigonometrical levelling between the Black Sea and the Caspian, executed by Messrs. Fuss, Sabler, and Sawitsh (concluded on the 23rd of October, 1837, after seventeen months and a half of assiduous labour), gives the level of the Caspian 81·4 feet below the level of the Euxine.

The Bolor Tag, strictly speaking, extends in the direction of the meridian from 32½° N. to 45°; but it may be regarded, with perfect propriety, as part of the long series of elevations which extend from the shores of the Icy Sea to Cape Comorin—all parallel to the meridian—each terminating nearly in the parallel of latitude on which that immediately to the south commences—but each, as we advance from north to south, placed farther to the east than the one which preceded it. These ranges are—the Ural, the Bolor, the Paralasa, the Suleiman, and the Ghauts. The uninterrupted continuity of the Bolor from the parallel of 32½° S. of its intersection with the Himalaya, the Kuenlun, and the Hindu-kush, to the parallel of 45¼° N. of its intersection with the Tien-shan, appears to be established. This is a line of 780 miles. The culminating points are supposed to exceed 18,000 feet, and are situated between 35° and 40° S.,—about the *knots* formed by the intersection of the ranges parallel with the equator. The southern knot, in particular, appears to have occasioned a colossal elevation of the earth's surface. North of the Tien-shan the height of the Bolor is much diminished, though the Kasyurt has summits that enter the regions of perpetual snow. The Kara-tau appears to be the northern termination of the Bolor; it diverges to the north-east, and sinks down into the plains traversed by the Tshui, which issues from Lake Timurtu. Like the Ural, and most of the other meridional ranges, the Bolor is composed of a number of chains nearly parallel. There are three great passes across it: that of Yarkand, to the north; that of Pamir; and the one traversed by Goes in 1603, and in part explored by Lieutenant Wood.

The Cordillera of the Andes, and the range of Kuen-lun (comprehending under that designation Hindu-kush and the Persian Elborz), are the greatest longitudinal elevations on the face of the globe. The Kuen-lun, and not the Himalaya, is the eastern prolongation of the Hindu-kush, west of the Bolor. The direction of the Kuen-lun, east of the Bolor, is indicated by the

position of the pass of Kara-korum, which is deduced from the position of Khotan, determined astronomically by the Fathers Felix d'Arocha, Hallerstein, and Espinha. These missionaries place Khotan in 37° N. lat., and 78° 13′ E. long. (from Paris). This gives the crest of the pass of Kara-korum 35° 50′ N. and 75° 54′ E. of Paris. This elevated pass, on the crest of which appears to be the watershed between the affluents of the Yarkand river and those of the Indus, is somewhat lower than the summits of the adjoining mountains, which appear to be 18,000 feet in height. The principal eminence of the Kuen-lun is supposed, by Baron von Humboldt, to be about 70 or 75 miles south of Khotan. Farther east the range takes the direction of east-south-east, and is known by the name of A-neu-ta. The Kuen-lun crosses the elevation of the Gobi about 84¼° (?) E. of Paris. Its mean direction is disturbed at the eastern boundary of the desert of Makhai, a part of the Gobi, either by the swelling of that plateau, or by the great mountain-knot, rising above the snow-line, which surrounds the Koko-nor. The Kuen-lun extends, intersected at different points by meridional ranges, to the western districts of the province of Kansu.

Thus has the same great thinker—who *made* the geography of America—traced in bold outline the features of the interior of Asia. He has given to the geography of that region an accuracy and precision which it did not before possess; and it must also be kept in mind that his services here are even greater than appear from the work under review, for much of what had been previously accomplished by the distinguished geographers of Berlin was suggested by the partially published investigations of Baron von Humboldt.

The third volume—devoted to the comparative climatology of Asia, and to terrestrial magnetism—although of deep interest to the geographer, belongs more properly to the department of the meteorologist. It lends completeness to the picture of the internal structure of the Asiatic continent contained in the two preceding volumes. Appended to it is a valuable series of routes in Central Asia, supplementary to the one contained in the 'Fragmens Asiatiques.' There is also a curious extract from unpublished letters of Leibnitz to Peter the Great, suggesting magnetical observations destined to be accomplished one hundred and twenty years after the death of that great philosopher.

We cannot better conclude this inadequate attempt to convey an idea of the stores of information condensed in these three volumes, than with the eloquent expression of the importance of such inquiries which concludes the Introduction to the work:—

"In tracing this picture of the structure of the Asiatic continent and its climate, I have been anxious to confine myself within the limits of

direct observation, and the induction which results from the combination of facts. The character of our age leads me to hope that the severe exactness of science and the precision of numerical statement, are no longer considered incompatible with the free play of thought. Science has revealed to us the traces of numerous revolutions which the globe has undergone. Disdaining the aberrations of a fantastic geology, science has opened, by the constant accumulation of observations, by the improved study of organic remains embedded in rock formations, new ways to penetrate into the depths of time and space. This is one of the great triumphs of human reason and of the manifestations of its power. The felicitous application of scientific methods, the more just appreciation of the relations which bind together all the phenomena and all the forces of nature, ought to exercise a beneficial influence on geographical studies, by extending the horizon they contemplate—on historical pursuits, by throwing light on the influence exercised by soils and climates—on the migrations of races—on physical investigation, by enabling us to generalize our views of the strata of the undulating atmospheric ocean, the earth which it embraces and impregnates, and the distribution of life from the snowy mountain-summits radiant with light, to the dark abysses of ocean."

II.—*Elémens de l'Histoire du Genre Humain, avec Figures, Plans et Cartes géographiques d'après les Documens les plus récents.* Par M. DALLY, Professeur de Géographie et d'Histoire, &c. &c. Bruxelles, 1842. (Deux cahiers en 4.) [By the Editor.]

THIS publication is an attempt on the part of the author to produce a system of geography of which the classification and arrangement shall be deduced from the natural features of the globe, and which shall present a comprehensive and truthful portraiture of the superficies of the earth, calculated to render the leading events of universal history, and their connection with each other, more easily understood. It is the geographical introduction to a history of the human race.

This general view of geography is divided into three sections:—The first treats of the preliminary information, mathematical and physical, required by the student of systematic geography. This portion of the work admitted of little novelty, but it is characterised by lucid arrangement and neatness of finish in all its parts. The second section treats of the surface of the globe in general; and the third, of the old world in particular. It is in these that the author's peculiar views of the structure of the globe, and of a geographical nomenclature and classification, based upon its natural features, are developed and illustrated.

M. Dally, taking his station (hypothetically) at Behring's Straits, points out two great lines of elevation, winding and unequal, but with a mean direction, the one to the S.E., the other

to the S.W. The western line of elevation extends from Cape Prince of Wales (174° 30′ E., 66° 15′ N.) to Cape Horn 67° 15′ W., 55° 58′ N.); the eastern, from Cape Tshutskoi (172° 39′ W., 65° 33′ N.) to the Cape of Good Hope (18° 28′ E., 34° 22′ N.). A line bisecting the angle formed by these two, drawn to Cape Tasman (147° 25′ E., 43° 32′ S.), runs through the broken and scattered elevations of Oceania to the extremity of the largest mass of what Humboldt terms the aquatic hemisphere. The two external lines M. Dally regards as the frame-work of the elevated solid surface of the globe—as the main pillars of the structure upon which all the rest depend. They furnish him, therefore, with his first grand division of the solid portion of the globe and also of the aqueous.

The eastern line of elevation, its lateral chains and declivities, constitute the old or long-known world. The central and western lines of elevation, together with the lands around the arctic and antarctic poles, constitute the new or more recently-discovered world. Two of these five masses (or groups) are subdivided by intersecting seas into minor masses. Hence it happens that there are eight parts of the solid surface of the earth, each of which may be considered as in itself a whole: in the old world, the three coherent masses of Europe, Asia, and Africa; in the new, the two coherent masses of North and South America, and the groups of Oceania, and the Arctic and Antarctic lands.

Retaining his station at Behring's Straits, M. Dally next directs his attention to the divisions of the ocean, as indicated by the outlines of the solid earth. The first divisions that occur to him as decidedly marked by natural features are the oceans that wash the arctic and antarctic regions; these he circumscribes by the polar circles. Two great oceans connect these extreme collections of waters: the Atlantic ocean, flowing like a river between Europe and Africa on the east, and the two Americas on the west; and the Pacific, similarly situated between Asia and Australia on the west, and the two Americas on the east. A third ocean originates at the southern shores of Asia, and extends southward between Africa on the west and Australia on the east. The polar oceans are, according to M. Dally, sharply defined by the polar circles. The three Mediterranean oceans are defined with equal precision at their northern extremities by the portions of the solid earth that separate them: advancing to the south they become confounded in one great watery zone. The southern points at which this fusion commences are—the Cape of Good Hope, Cape Tasman, and Cape Horn; and south of these points their meridians are taken as the lines of demarcation for the three oceans. M. Dally recognises two minor seas communicating with the Atlantic (the Mediterranean and the sea of the Antilles), and one

with the Indian Ocean (the Red Sea). It is difficult to conceive why the Baltic and the Persian Gulf have been omitted, except for the purpose of arbitrarily establishing eight oceanic divisions to correspond with the eight divisions of the solid earth. M. Dally's eight oceanic divisions are—the Arctic and the Antarctic oceans; the Atlantic, the Pacific, and the Indian oceans; and the three Mediterranean seas, the Red Sea, the sea of the Antilles, and the Mediterranean properly so called.

The third section contains a systematic review of the geography of the old world, arranged according to the opinions developed in the second. This third section is divided into three chapters: the first devoted to trace the general aspect of the old world with regard to its position and dimensions, its superficial forms, and its dependent island groups; the second, to the orography of the whole world; and the third, to its hydrography.

Under the head of orography, the different regions of the old world are classified and described in succession, by adhering to the hypothesis of a great central line of elevation extending from Behring's Straits to the Cape of Good Hope. This dorsal chain of the first order is traced along the Kentai, the In-shan, the Kun-luen, &c. In connection with this chain, the northern region of plains (Siberian and European) and the parallel region of deserts (Asiatic and African) to the S., are passed in review. The chains of elevations of the second order are those which, according to M. Dally, branch out at right angles, or nearly at right angles, to his great central range. To this class he reckons the lateral chains of China, the Himalayas, &c.; they are enumerated, first, those on the eastern, and then those on the western side of the great range, in their order from N. to S. The chains of the third order, at right angles to the second, are indicated, but not fully enumerated.

The hydrography of the old world is classified in an analogous manner: 1st, maritime basins; 2nd, lacustrine basins; 3rd, fluviatile basins. The grand ocean is the maritime basin of the first order: the maritime basins of the second and third order are arranged in a western and eastern division, and enumerated in their order from N. to S. The lacustrine basins are divided into five orders: little lakes, of 10 leagues in extent; middling, of 20 leagues; large, from 20 to 50 leagues; very large, from 50 to 100 leagues; and internal seas. The tabular arrangement of the first order is given as a specimen. A fluviatile basin comprehends the valleys of the main trunk and all its affluents; in the same way that a maritime or lacustrine basin comprehends the fluviatile basins of all its tributaries. A stream of water, the course of which is less than 50 leagues, is called a small watercourse; one from 50 to 100 leagues, a middling watercourse;

one from 100 to 300 leagues, a great; and if above that, a very great watercourse. A stream, of whatever size, which rises in the great central chain, or in an angle formed by it and a secondary chain, is called of the first order; one which rises in a secondary chain, or in an angle formed by it and a tertiary chain, of the second order; one which rises in a tertiary chain, of the third order. As in the case of the lacustrine basins, M. Dally merely gives, by way of specimen, a classified catalogue of the more important fluviatile basins of the first order.

This system of geographical classification and nomenclature, viewed merely as a technical aid to memory, an artificial framework in which every fact may find its place, is characterised by comprehensiveness and simplicity. Viewed with reference to geographical facts, it will be found to rest not unfrequently upon imaginary assumptions and unfounded analogies. Many of M. Dally's postulates regarding his central chains and their dependencies are at variance with the facts both of geology and geography. His 'Appendice Historique,' in which he briefly indicates the influence of geographical formation upon the progress of civilization, is still more open to this charge.

With all its defects, however, this work is an able and ingenious attempt to supply, what is at present the great desideratum in geography, an improved systematic arrangement and nomenclature. From its general character we should infer that the author's mind is elegant and accomplished, but that the imaginative preponderates over the reasoning faculty.

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